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TM 9-791

\*RESTRICTED

WAR DEPARTMENT

~~U.S. Dept. of Army~~  
TECHNICAL MANUAL

# ARMORED TRAILER M8

JANUARY 8, 1943

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TECHNICAL MANUAL  
No. 9-791

★ ★ WAR DEPARTMENT  
Washington, January 8, 1943

# ARMORED TRAILER M8

Prepared under the direction of the  
Chief of Ordnance  
(with the cooperation of Deere & Company)

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\* This TM supersedes TM 9-884, September 12, 1942.

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## ARMORED TRAILER M8

## PART ONE—Operating Instructions

## Section I

## INTRODUCTION

	Paragraph
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## 1. SCOPE.

- a. This manual is published for the information of the using arms and services.
- b. In addition to a description of the Armored Trailer M8, this manual contains technical information required for the identification, use, and care of the materiel.
- c. Disassembly, assembly, and such repairs as may be handled by the using arm personnel may be undertaken only under the supervision of an officer or the chief mechanic.
- d. In all cases where the nature of the repair, modification, or adjustment is beyond the scope or facilities of the unit, the responsible ordnance service should be informed so that trained personnel with suitable tools and equipment may be provided, or proper instructions issued.

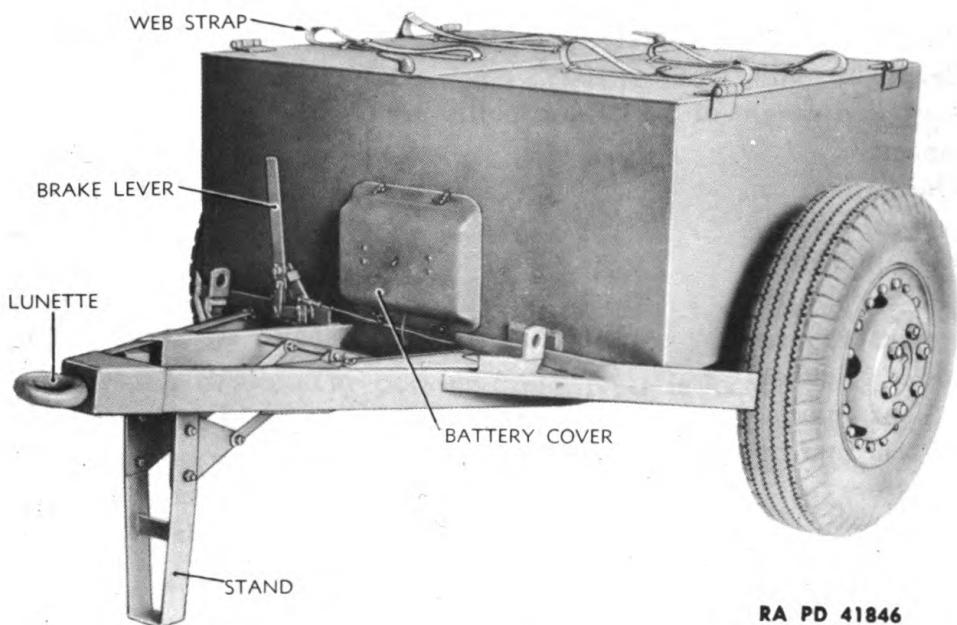
## 2. CHARACTERISTICS.

- a. The trailer (figs. 1 and 2) is a two-wheeled, rubber-tired vehicle to be towed behind tanks, half-tracks, or 2 1/2-ton trucks. It permits carrying a reserve supply of fuel and ammunition with the column. The box is mounted on a channel iron framework to which is also welded the axle. The box is constructed of steel plates and has two hinged covers. Web straps, inside the box and on the covers, hold the cargo in place.

- b. The pintle hitch by which this trailer is towed is supplied with the unit and is secured to the rear of the towing vehicle. The pintle hitch is equipped with a cable release, operated from the towing vehicle, for disconnecting the trailer while the vehicle is moving forward. Combat vehicles other than tanks usually have pintle hitches that are suitable for towing these trailers installed permanently.

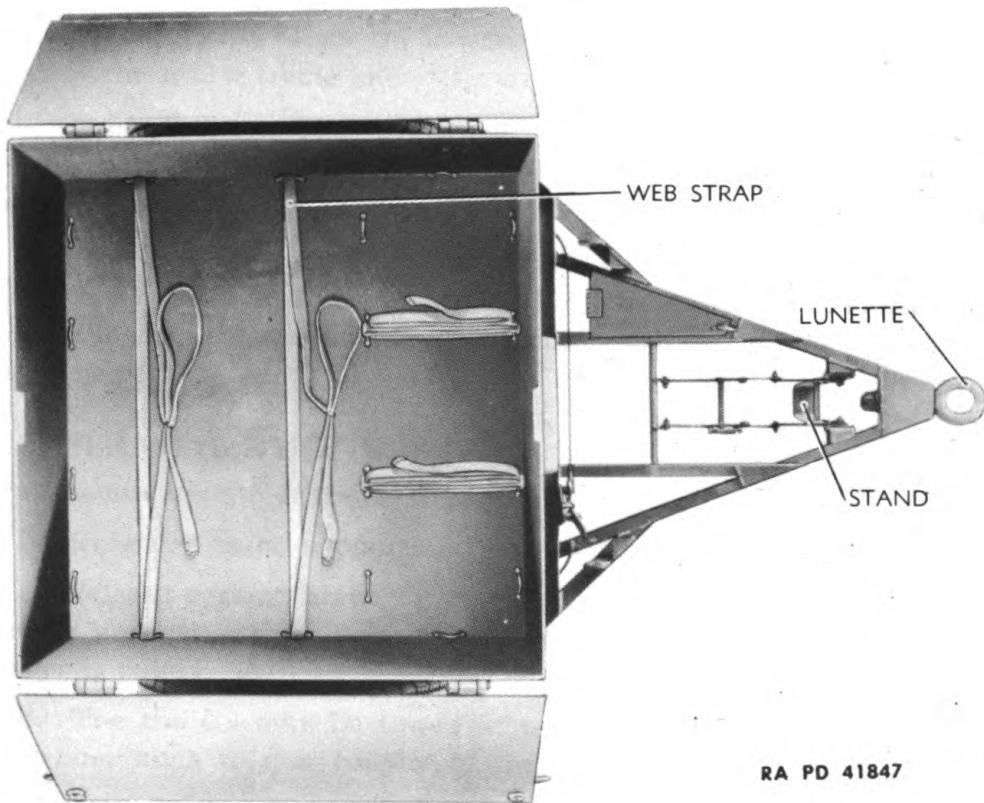
- c. The wheels are equipped with brakes which are operated by a hand lever located on the front of the trailer box. These brakes are to be used for parking purposes only.

## INTRODUCTION



RA PD 41846

**Figure 1—Armored Trailer M8—Left Front**



RA PD 41847

**Figure 2—Armored Trailer M8—With Covers Open—Overhead**

## ARMORED TRAILER M8

## 3. DATA.

Weight of trailer complete with tools	2,640 lb
Weight of pintle hitch	218 lb
Combined weight of trailer and pintle hitch	2,858 lb
Capacity	2,200 lb
Wheel tread	75 in.
Over-all length	118 $\frac{1}{4}$ in.
Over-all width	88 $\frac{5}{8}$ in.
Over-all height	52 $\frac{1}{4}$ in.
Ground clearance	16 $\frac{1}{2}$ in.
Armor thickness	
Sides and back	$\frac{3}{8}$ in.
Front and covers	$\frac{1}{4}$ in.
Bottom	$\frac{1}{8}$ in.
Tire pressure	35 lb
Towing speed	40 mph

## Section II

## OPERATION AND CONTROLS

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Operating the vehicle .....	5
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## 4. GENERAL INFORMATION ON CONTROLS (figs. 3 and 4).

- a. **Parking Brake.** The parking brake lever is located at the right front of the box. The brake should be applied whenever the trailer is disconnected from towing vehicle, whether on a slope or on level ground. The brake should never be used for any other purpose than parking, and must be released before the trailer is transported.
- b. **Light Switch.** The taillights are operated by the switch at the front of the battery box which is located at the front of the vehicle (fig. 1).
- c. **Web Straps.** All web straps inside the box and on the box covers must be kept tight when vehicle is loaded to secure cargo.
- d. **Pintle Hitch.** When not in use, the pintle hitch is carried on the front of the trailer frame and is secured by two pins.
- e. **Cable Release.** The 15-foot cable which may be operated by the tank personnel provides a quick release for disconnecting the trailer from the tank.
- f. **Bracket.** The pintle hitch bracket which carries the cable release pulley is hinged at the lower end. By pulling the cotter pin and removing the locking pin the bracket can swing down, permitting cranking of the tank engine.

## 5. OPERATING THE VEHICLE.

- a. Secure lunette of trailer to pintle hitch.
- b. Raise the stand supporting front end of trailer.
- c. Release parking brake by moving lever toward center of trailer. This is important, since damage may result if brakes are locked when trailer is pulled.
- d. The trailers may be towed in tandem by attaching the lunette on trailer hitch to rear coupler of the front trailer.

## 6. LOADING.

- a. When the trailer is loaded, care must be taken to place the heaviest

## ARMORED TRAILER M8

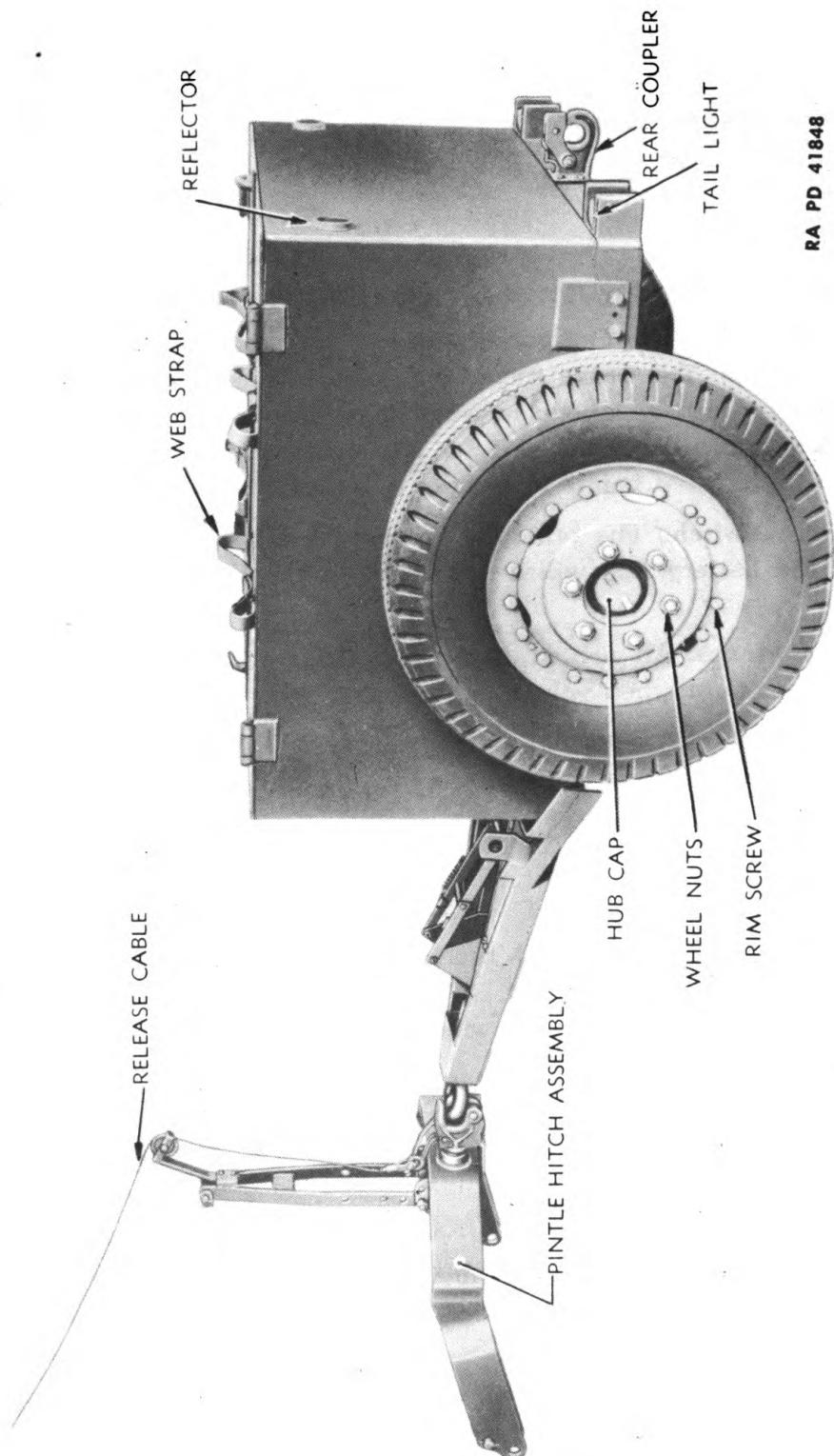
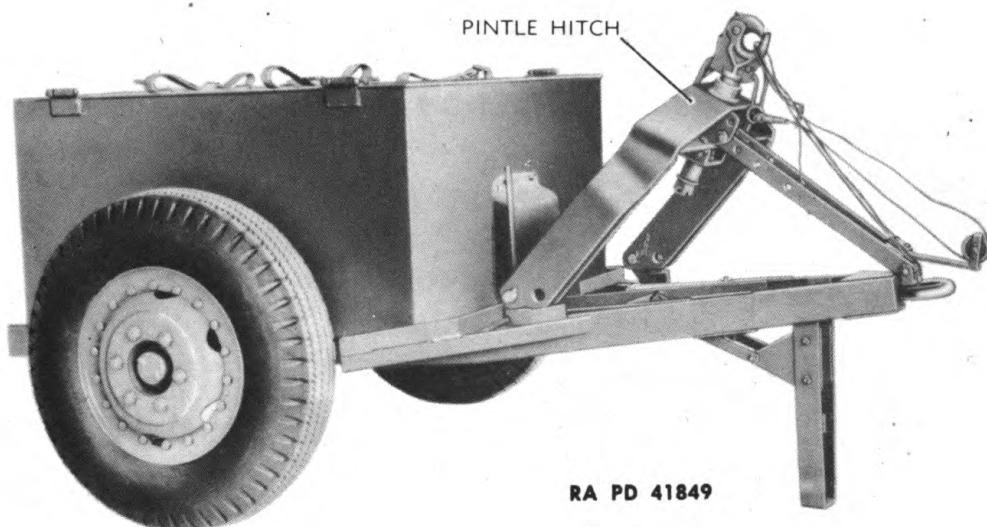


Figure 3—Trailer and Pindle Hitch Assembly—Left Rear

## OPERATION AND CONTROLS



**Figure 4—Trailer With Extra Pintle Hitch**

load in the center immediately over the axle, so that the weight will be evenly distributed. Too much weight at the rear may result in the trailer capsizing. Too much weight at the front will make hitching difficult.

## ARMORED TRAILER M8

## Section III

## INSPECTION

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## 7. INITIAL INSPECTION.

a. The trailer is shipped complete, and upon arrival at destination inspection of the following should be made:

(1) See that the batteries are in place inside of cover at front of box. Remove tape from upper battery leads and connect them to upper battery positive terminals. The combat zone safety taillights should operate properly when the switch is turned to the "ON" position.

(2) Check air pressure in tires. Tires should be inflated to 35-pound pressure. For shipping purposes, tires are inflated to 45-pound pressure.

(3) Check tools to make certain that they are all present inside tool box.

(4) Check brake lever and cables and see that the brakes function properly.

(5) See that the four 15-foot web straps are in position in the box, and that the four 5-foot web straps are in place on the box covers.

## 8. PRESTARTING INSPECTION.

a. Before towing the vehicle, the following points should be checked:

(1) Check pintle latch on tank for correct functioning.

(2) Inspect cable from tank to pintle for kinks and wear.

(3) Check box covers carefully for correct functioning of handles and latches.

(4) Check straps for holding down cargo, both on lid and inside of box, and see that straps and fasteners are in good condition.

(5) Check tools inside tool box.

(6) Check taillights for correct operation.

(7) Check tires for inflation and injuries.

(8) Check brakes for proper functioning.

## 9. INSPECTION DURING HALT.

a. Inspect hitch on towing vehicle and check on the security of lunette eye in hitch.

**INSPECTION**

- b. Be sure cable has not become twisted or kinked.
- c. Inspect load to be sure straps have not become loosened, permitting load to shift or become lost.
- d. Check brake drums for overheating.
- e. Check wheel nuts.
- f. Inspect tires for damage or underinflation.

**10. INSPECTION AFTER OPERATION.**

a. After operation, an inspection should be made similar to that made before starting, but more thorough and detailed. The inspection should be followed by preventive maintenance. If the defects cannot be corrected, they should be reported to the next higher authority. In addition to the points covered in paragraph 8, the following points should be covered:

- (1) Wheel stud nuts must be tightened after the trailer has been in use a short time, and should be checked periodically thereafter to be sure they are tight. The nuts on the right-hand wheel have right-hand threads, and the nuts on the left-hand wheel have left-hand threads.
- (2) Inspect pintle hitch holding pins for excessive wear and replace pins if required.
- (3) Check box and frame bolts; tighten or replace, as required.
- (4) Feel brake drums and hubs for evidence of overheating.
- (5) Remove hub cap from wheel and determine if bearings are properly lubricated.

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### Section IV

#### LUBRICATION

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#### 11. INTRODUCTION.

a. Lubrication is an essential part of preventive maintenance, determining to a great extent the serviceability of parts and assemblies. Lubrication, or the lack of it, influence materially repairs and operations, and is one of the most important factors affecting dependable service and useful vehicle life.

#### 12. SCHEDULES.

a. The chassis and slow-motion parts should be lubricated every 7 days or 50 hours of vehicle operation. Severe operating conditions may necessitate immediate attention, especially in cases where vehicle components have been submerged in water, chemicals, snow, or mud.

b. **Records.** A complete record of lubrication will be kept for every vehicle. Responsible personnel will execute a check sheet at regular intervals to indicate the actual mileage and date at which each component receives such attention as prescribed.

#### 13. METHODS.

a. Wheels should be removed twice a year, bearings and oil retainers checked, and if bearings are worn or retainers impregnated with dirt, they should be replaced. Wheel hubs and bearings should be thoroughly cleaned with SOLVENT, dry-cleaning, coated lightly with engine oil and repacked with GREASE, general purpose, No. 2.

b. The stand support joints, pintle hitch, and rear coupler should be given a few drops of oil occasionally with an oil can.

## Section V

## CARE AND PRESERVATION

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Painting metal surfaces	17
Paint as a camouflage	18
Removing paint	19
Painting lubricating devices	20

## 14. RECORDS.

a. Use. An accurate record must be kept of each motor vehicle issued by the Ordnance Department. For this purpose the Ordnance Motor Book (O.O. Form No. 7255), generally called "Log Book," is issued with each vehicle and must accompany it at all times. This book furnishes a complete record of the vehicle, from which valuable information concerning operation and maintenance costs, etc., are obtained, and organization commanders must insist that correct entries are made. This book will habitually be kept in a canvas cover to prevent its being injured or soiled.

b. The page bearing a record of assignment must be destroyed prior to entering the combat zone. All other references which may be posted regarding the identity of the organization must also be deleted.

## 15. GENERAL.

a. Ordnance materiel is painted before issue to the using arms and one maintenance coat per year will ordinarily be ample for protection. With but few exceptions, this materiel will be painted with ENAMEL, synthetic, olive-drab, lusterless. The enamel may be applied over old coats of long oil enamel and oil paint previously issued by the Ordnance Department if the old coat is in satisfactory condition for repainting.

b. Paints and enamels are usually issued ready for use and are applied by brush or spray. They may be brushed on satisfactorily when used unthinned in the original package consistency, or when thinned no more than 5 percent by volume with THINNER. The enamel will spray satisfactorily when thinned with 15 percent by volume of THINNER. (Linseed oil must not be used as a thinner since it will impart a luster not desired in this enamel.) If sprayed, it dries hard enough for repainting within  $\frac{1}{2}$  hour and dries hard in 16 hours.

c. Complete information on painting is contained in TM 9-850.

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## 16. PREPARING FOR PAINTING.

a. If the base coat on the materiel is in poor condition, it is more desirable to strip the old paint from the surface than to use sanding and touch-up methods. After stripping, it will then be necessary to apply a primer coat.

b. PRIMER, synthetic, refinishing, should be used on wood as a base coat for synthetic enamel. It may be applied either by brushing or spraying. It will brush satisfactorily as received, or after the addition of not more than 5 percent by volume of THINNER. It will be dry enough to touch in 30 minutes, and hard in 5 to 7 hours. For spraying, it may be thinned with not more than 15 percent by volume of THINNER. Lacquers must not be applied to the PRIMER, synthetic, refinishing, within less than 48 hours.

c. PRIMER, synthetic, rust-inhibiting, for bare metal, should be used on metal as a base coat. Its use and application is similar to that outlined in subparagraph b above.

d. The success of a job of painting depends partly on the selection of a suitable paint, but also largely upon the care used in preparing the surface prior to painting. All parts to be painted should be free from rust, dirt, grease, kerosene, oil, and alkali, and must be dry.

## 17. PAINTING METAL SURFACES.

a. Metal parts in need of cleaning should be washed in a liquid solution consisting of  $\frac{1}{2}$  pound of SODA ASH in 8 quarts of warm water, or an equivalent solution; then they should be rinsed in clear water and wiped thoroughly dry. When equipment is in fair condition and only marred in spots, the bad places should be touched with ENAMEL, synthetic, olive-drab, lusterless, and permitted to dry. The whole surface will then be sandpapered with PAPER, flint, No. 1 and a finish coat of ENAMEL, synthetic, olive-drab, lusterless, applied and allowed to dry thoroughly before the materiel is used. If the equipment is in bad condition, all parts should be thoroughly sanded with PAPER, flint, No. 2, or equivalent, given a coat of PRIMER, synthetic, refinishing, and permitted to dry for at least 16 hours. They will then be sandpapered with PAPER, flint, No. 00, wiped free from dust and dirt, and a final coat of ENAMEL, synthetic, olive-drab, lusterless, applied and allowed to dry thoroughly before the materiel is used.

## 18. PAINT AS A CAMOUFLAGE.

a. Camouflage is now a major consideration in painting ordnance vehicles. Rust prevention is secondary. The camouflage plan at present employed utilizes three factors: color, gloss, and stenciling.

(1) COLOR. Vehicles are painted with ENAMEL, synthetic, olive-drab, lusterless, which was chosen to blend in reasonably well with the average landscape.

## CARE AND PRESERVATION

(2) **GLOSS.** The new lusterless enamel makes a vehicle difficult to see from the air or from relatively great distances over land. A vehicle painted with ordinary glossy paint can be detected more easily and at greater distances.

(3) **STENCILING.** White stencil numbers on vehicles have been eliminated because they can be photographed from the air. A blue-drab stencil enamel is now used which cannot be so photographed. It is illegible to the eye at distances exceeding 75 feet.

### b. Preserving Camouflage.

(1) Continued friction or rubbing must be avoided, as it will smooth the surface and produce a gloss. The vehicle should not be washed more than once a week. Care should be taken to see that the washing is done entirely with a sponge or a soft rag. The surface should never be rubbed or wiped, except while wet, or a gloss will develop.

(2) It is not desirable that vehicles, painted with lusterless enamel, be kept as clean as vehicles were kept when glossy paint was used. A small amount of dust increases the camouflage value. Grease spots should be removed with **SOLVENT**, dry-cleaning. Whatever portion of the spot cannot be so removed should be allowed to remain.

(3) Continued friction of wax-treated tarpaulins on the sides of a vehicle will also produce a gloss, which should be removed with **SOLVENT**, dry-cleaning.

(4) Tests indicate that repainting with olive-drab paint will be necessary once yearly, with blue-drab paint twice yearly.

## 19. REMOVING PAINT.

a. After repeated paintings, the paint may become so thick as to crack and scale off in places, presenting an unsightly appearance. If such is the case, remove the old paint by use of a lime-and-lye solution (see TM 9-850 for details) or **REMOVER**, paint and varnish. It is important that every trace of lye or other paint remover be completely rinsed off and that the equipment be perfectly dry before repainting is attempted. It is preferable that the use of lye solutions be limited to iron or steel parts. If used on wood, the lye solution must not be allowed to remain on the surface for more than a minute before being thoroughly rinsed off and the surface wiped dry with rags. The surfaces thus prepared should be painted according to directions in paragraph 17.

## 20. PAINTING LUBRICATING DEVICES.

a. Oil cups, grease fittings, oilholes, and similar lubricating devices, as well as a circle about three-fourths of an inch in diameter at each point of lubrication, will be painted with **ENAMEL**, synthetic, glossed, in order that they may be readily located. Do not paint openings in fittings through which lubricant passes.

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Section VI

TOOLS AND EQUIPMENT ON THE VEHICLE

	Paragraph
Introduction	21
Tools	22

**21. INTRODUCTION.**

a. The materiel indicated herein includes tools for general care and maintenance, and Motor Book for Ordnance Vehicles (O.O. Form 7255) to record the vehicle history.

**22. TOOLS.**

a. Tools issued with these vehicles (fig. 5) are carried in the tool box.

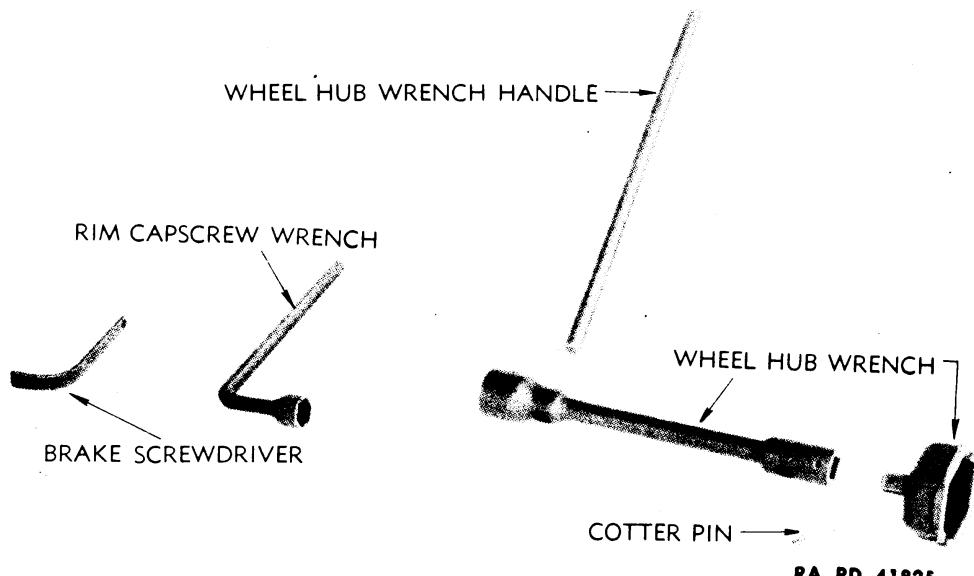
SCREWDRIVER, brake

adjusting

WRENCH, rim bolt

WRENCH, wheel studs and hub

cap, complete with handle



**Figure 5—Tools**

## Section VII

### MATERIEL AFFECTED BY GAS

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#### 23. PROTECTIVE MEASURES.

a. When materiel is in constant danger of gas attack, unpainted metal parts will be lightly coated with oil. Instruments are included among the items to be protected in this manner from chemical clouds or chemical shells, but ammunition is excluded. Care will be taken that the oil does not touch leather or canvas fittings. Materiel not in use will be protected with covers as far as possible. Ammunition will be kept in sealed containers.

#### 24. CLEANING.

a. All unpainted metal parts of materiel that have been exposed to any gas except mustard and lewisite must be cleaned as soon as possible with SOLVENT, dry-cleaning, or ALCOHOL, denatured, and wiped dry. All parts should then be coated with engine oil.

b. Ammunition which has been exposed to gas must be thoroughly cleaned before it can be fired. To clean ammunition use AGENT, decontaminating, noncorrosive, or if this is not available, strong soap and cool water. After cleaning, wipe all ammunition dry with clean rags. CAUTION: Do not use dry powdered AGENT, decontaminating (chloride of lime) (used for decontaminating certain types of materiel on or near ammunition supplies), as flaming occurs through the use of chloride of lime on liquid mustard.

#### 25. DECONTAMINATION.

a. For the removal of liquid chemicals (mustard, lewisite, etc.) from materiel, the following steps should be taken:

##### (1) PROTECTIVE MEASURES.

(a) For all of these operations a complete suit of impermeable clothing and a service gas mask will be worn. Immediately after removal of the suit, a thorough bath with soap and water (preferably hot) must be taken. If any skin areas have come in contact with mustard, if even a very small drop of mustard gets into the eye, or if the vapor of mustard has been inhaled, it is imperative that complete first-aid measures be given within 20 to 30 minutes after exposure. First-aid instructions are given in TM 9-850 and FM 21-40.

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(b) Garments exposed to mustard will be decontaminated. If the impermeable clothing has been exposed to vapor only, it may be decontaminated by hanging in the open air, preferably in sunlight for several days. It may also be cleaned by steaming for 2 hours. If the impermeable clothing has been contaminated with liquid mustard, steaming for 6 to 8 hours will be required. Various kinds of steaming devices can be improvised from materials available in the field.

(2) **PROCEDURE.**

(a) Commence by freeing materiel of dirt through the use of sticks, rags, etc., which must be burned or buried immediately after this operation.

(b) If the surface of the materiel is coated with grease or heavy oil, this grease or oil should be removed before decontamination is begun. **SOLVENT**, dry-cleaning, or other available solvents for oil should be used with rags attached to ends of sticks. Following this, decontaminate the materiel with bleaching solution made by mixing one part **AGENT**, decontaminating (chloride of lime), with one part water. This solution should be swabbed over all surfaces. Wash off with water; dry and oil all surfaces.

(c) All unpainted metal parts exposed to mustard or lewisite must be decontaminated with **AGENT**, decontaminating, noncorrosive, mixed one part solid to fifteen parts solvent (**ACETYLENE TETRACHLORIDE**). If this is not available, use warm water and soap. Bleaching solution must not be used because of its corrosive action. Instrument lenses may be cleaned only with **PAPER**, lens, tissue, using a small amount of **ALCOHOL**, ethyl. Coat all metal surfaces lightly with engine oil.

(d) In the event **AGENT**, decontaminating (chloride of lime), is not available, materiel may be temporarily cleaned with large volumes of hot water; however, mustard lying in joints or in leather or canvas webbing is not removed by this procedure and will remain a constant source of danger until the materiel can be properly decontaminated. All mustard washed from materiel in this manner lies unchanged on the ground, necessitating that the contaminated area be plainly marked with warning signs before abandonment.

(e) The cleaning or decontaminating of materiel contaminated with lewisite will wash arsenic compounds into the soil, poisoning many water supplies in the locality for either men or animals.

(f) Leather or canvas webbing that has been contaminated should be scrubbed thoroughly with bleaching solution. In the event this treatment is insufficient, it may be necessary to burn or bury such material.

(g) Detailed information on decontamination is contained in FM 21-40, TM 9-850, and TC 38, 1941, Decontamination.

**PART TWO—Organization Maintenance****Section VIII****GENERAL INFORMATION ON MAINTENANCE**

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Definition of terms	27
Allocation of repair jobs	28

**26. SCOPE.**

a. The scope of maintenance and repairs by the vehicle crews and maintenance personnel of the using arms is determined by the ease with which the project can be accomplished, the amount of time available, weather conditions, concealment, shelter, proximity to hostile fire, equipment and parts available, and skill of the personnel. Since all of these factors are variable, no exact system or procedure can be prescribed or followed.

**27. DEFINITION OF TERMS.**

a. **Service.** Comprises cleaning, lubricating, tightening bolts and nuts, and making external adjustments of subassemblies, or assemblies, and controls.

b. **Repair.** Comprises making repairs to, or replacement of, the part, subassembly, or assembly that can be accomplished without disassembling completely the materiel concerned, and does not require heavy welding or riveting, machining, fitting, and or alining.

c. **Replace.** Comprises removing the part, subassembly, or assembly from the vehicle and exchanging it for a new, reconditioned, or rebuilt part, subassembly, or assembly as the case may be.

**28. ALLOCATION OF REPAIR JOBS.**

a. The following are the maintenance duties for which tools and parts have been provided the using arm personnel. Other replacements and repairs are the responsibility of the other maintenance personnel, but may be performed by the using arm personnel, when circumstances permit, within the discretion of the pertinent ordnance officer.

**PINTLE HITCH**

Hitch assembly	Replace
Pintle	Replace
Support	Replace
Release cable	Replace

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## BOX

Covers	Replace
Straps	Replace
Box assembly	Replace

## FRAME

Lunette	Replace
Stand	Replace

## ELECTRICAL SYSTEM

Batteries	Replace
Cables	Replace assemblies
Switch	Replace
Lights	Service and replace

## WHEELS

Bearings	Adjust and replace
Grease retainers	Replace

## TIRES

Tubes	Repair and replace
Tires	Repair and replace

## BRAKES

Brakes	Adjust
Shoes	Replace assembly
Lever	Replace
Cables	Replace

## MISCELLANEOUS

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## Section IX

### ORGANIZATION SPARE PARTS AND ACCESSORIES

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#### 29. ORGANIZATION SPARE PARTS.

a. A set of organization spare parts is supplied to the using arms for field replacement of those parts most likely to become broken, worn, or otherwise unserviceable. The set is kept complete by requisitioning new parts for those used. Organization spare parts are listed in pertinent standard nomenclature lists.

b. Care of organization spare parts is covered in section V of this manual.

#### 30. ACCESSORIES.

a. Accessories include tools and equipment required for such disassembling and assembling as the using arm is authorized to perform. Accessories should not be used for purposes other than as prescribed, and when not in use, should be properly stored.

## ARMORED TRAILER M8

## Section X

## PINTLE HITCH

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## 31. DESCRIPTION.

a. The pintle hitch consists of a frame which is secured to the shackle lugs at the rear of a tank by means of pins. The frame is made fast by a support which is bolted to the frame at its lower end and held in clevises by a pin at its upper end. These clevises are welded to the rear of the tank. The quick-release pintle assembly is carried by the frame and secured to it by a washer, nut, and cotter pin. The release cable is fastened to the pintle roller housing and passes over a pulley and into the tank. The pulley is bolted to a bracket which is hinged to the pintle hitch support.

b. **Functioning.** The trailer lunette fits into the pintle and is held fast by the pintle roller housing. When the release cable is pulled, it trips the pintle roller housing and allows the trailer lunette to slip out of the pintle.

## 32. INSTALLATION ON TANK.

a. Before the trailer can be put into operation behind a tank not equipped with a center rear pintle, the pintle hitch assembly must be mounted on the rear of the tank. The pintle hitch assembly can be attached to Light Tanks M3 and M5, and Medium Tanks M3 and M4, as follows:

## (1) EQUIPMENT.

JACK, hydraulic

WRENCH, 1-in. (2)

PLIERS

## (2) PROCEDURE (figs. 6 and 7).

## (a) Remove Support from Frame.

WRENCH, 1-in. (2)

Remove two nuts, lock washers, and cap screws which secure support to frame and lift out support.

## (b) Attach Frame Assembly to Tank.

JACK, hydraulic

PLIERS

Remove rear towing shackles from tank. Place frame assembly on

## PINTLE HITCH

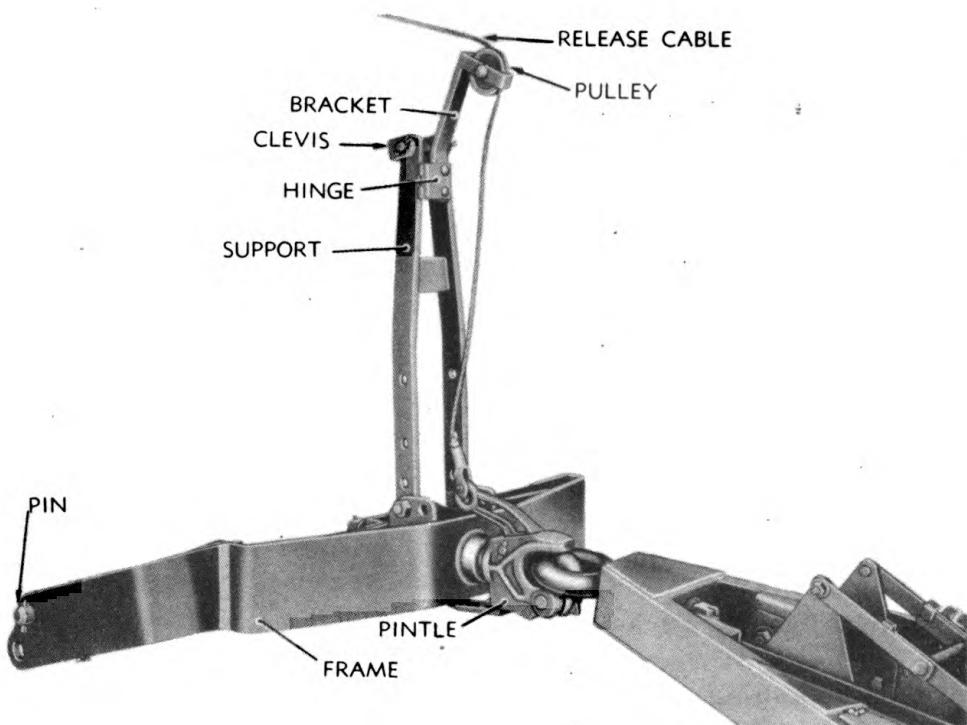
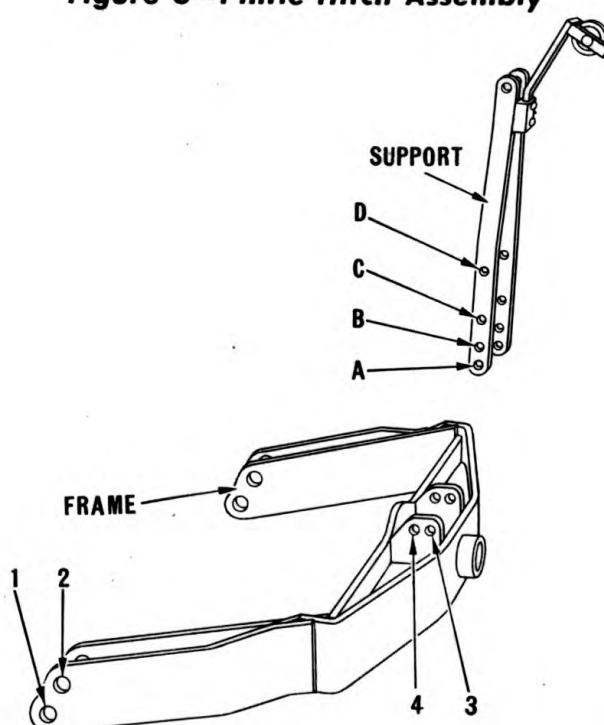


Figure 6—Pintle Hitch Assembly



RA PD 41851

Figure 7—Pintle Hitch Adjustments

**ARMORED TRAILER M8**

jack and raise into position. Attach assembly to shackle lugs with holding pins and cotter pins. Use holding pins through upper holes of frame for medium tanks and through lower holes for light tanks.

**(c) Secure Frame and Support.**

**PLIERS**

**WRENCH, 1-in. (2)**

Secure upper end of support to clevises with a rod end pin and cotter pin. Bolt lower end of support to pintle hitch frame with cap screws, lock washers, and nuts, using bolts through holes in support which will make trailer level when hitched behind tank.

**33. TROUBLE SHOOTING.**

**a. Pintle Will Not Secure Trailer Lunette.**

<b>Probable Cause</b>	<b>Probable Remedy</b>
Weak or broken roller housing spring.	Replace spring.

**b. Pintle Will Not Release Lunette.**

Pintle roller housing sticking.	Free housing and lubricate pin with OIL, engine, seasonal grade.
Broken release cable.	Install new cable.

**34. MAINTENANCE (fig. 8).**

- Inspect release cable for fraying or breaks and replace if damaged.
- Check pintle roller housing spring for breaks or permanent set, and replace spring if necessary.
- Check pintle hitch frame holding pins and support clevis pin for wear or breaks. Replace worn or broken pins and cotter pins.
- Tighten all cap screws and nuts.
- Lubricate pintle roller housing pin and release cable pulley with a few drops of engine oil.

**35. REPLACEMENT.**

**a. Equipment.**

**JACK, hydraulic**

**PLIERS**

**b. Procedure.**

**(1) REMOVE PINTLE HITCH ASSEMBLY.**

**JACK, hydraulic**

**PLIERS**

Place jack under frame and raise it until it supports hitch assembly. Pull out cotter pins from frame holding pins and from support rod end pin. Pull out holding pins and rod end pins and lower assembly.

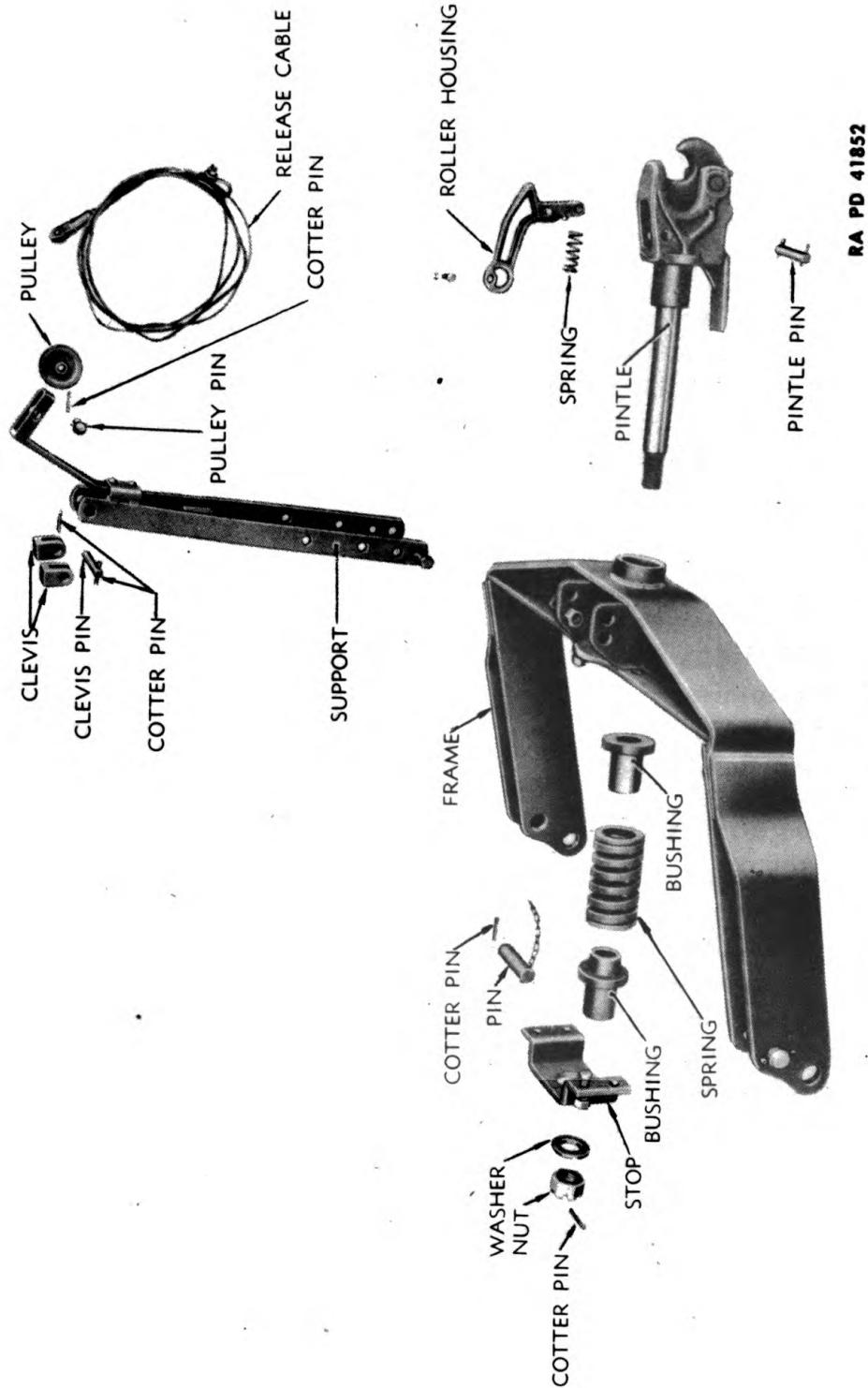
**(2) INSTALL NEW PINTLE HITCH ASSEMBLY.**

**JACK, hydraulic**

**PLIERS**

Raise pintle hitch assembly with jack until frame holes line up with tank shackle lug holes. Insert holding pins and secure pins with cotter pins. Secure pulley bracket support to clevises on tank with rod end pin and cotter pin.

**PINTLE HITCH**



**Figure 8—Pintle Hitch Details**

## ARMORED TRAILER M8

## Section XI

## BOX

	Paragraph
Description .....	36
Removal .....	37
Maintenance .....	38
Installation .....	39

## 36. DESCRIPTION.

a. The box is made from steel plates and has two hinged covers on top. The covers are secured with latches. The sides and back of the box are  $\frac{3}{8}$ -inch thick, the front and covers are  $\frac{1}{4}$ -inch thick, and the bottom is  $\frac{1}{8}$ -inch thick. The inside dimensions are: length 56 inches, width  $60\frac{3}{4}$  inches, and depth  $28\frac{1}{2}$  inches. Four  $1\frac{1}{2}$ -inch wide web straps, 15 feet long, are held in place by eighteen strap loops in the bottom of the box. Four  $1\frac{1}{2}$ -inch wide web straps, 5 feet long, are held in place on top of the covers by eight strap loops. These straps are used for securing the cargo.

## 37. REMOVAL.

## a. Equipment.

CHAIN (2)	WRENCH (to fit clamp screw)
CLAMP, "C" (4)	WRENCH, $\frac{7}{8}$ -in.
HOIST	WRENCH, open-end, $1\frac{1}{3}_2$ -in.
SCREWDRIVER	

## b. Procedure.

(1) REMOVE BATTERY COVER. Remove wing nuts and lock washers which secure battery cover to box and lower cover onto frame (fig. 9).

(2) REMOVE BATTERIES. Disconnect toggle switch to battery leads, marking leads to facilitate installation. Lift batteries out of clips.

## (3) REMOVE TOGGLE SWITCH.

SCREWDRIVER	WRENCH, open-end, $1\frac{1}{3}_2$ -in.
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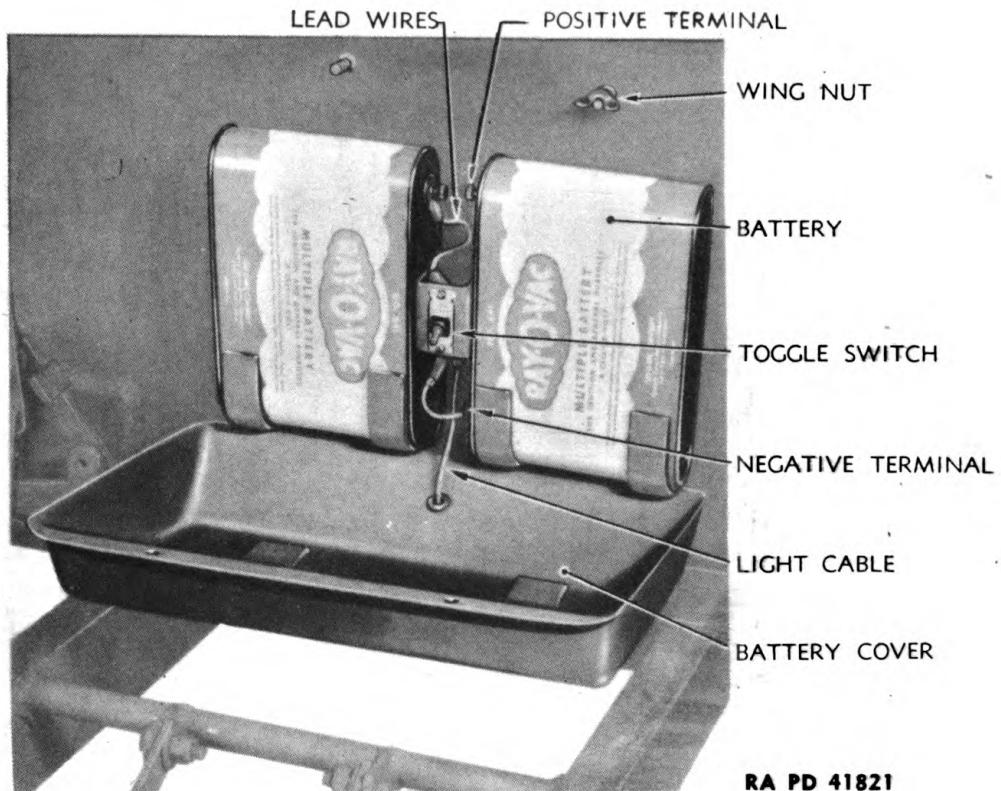
Disconnect light cable from switch. Remove nuts, lock washers, and screws which secure toggle switch to box and lift out switch and battery leads. Pull switch cable through grommet in battery cover.

## (4) REMOVE BOX FROM FRAME (fig. 10).

CHAIN (2)	WRENCH (to fit clamp screws)
CLAMP, "C" (4)	WRENCH, $\frac{7}{8}$ -in.
HOIST	

Remove eight cap screws holding box to frame. Open covers on box and attach C-clamps to each corner of box. Attach chains to C-clamps. Roll trailer under hoist and set trailer brakes. Lift box straight up until brackets on box clear frame, and then release trailer

## BOX

**Figure 9—Light Switch and Batteries—Installed**

brakes and roll frame away (fig. 11). Lower box to ground or floor and remove C-clamps and chains (fig. 12).

**38. MAINTENANCE.**

- a. Open and close covers and if they stick, place a few drops of engine oil on hinges.
- b. Check cover latches and if they do not work correctly, replace damaged parts.

**39. INSTALLATION.****a. Equipment.**

CHAIN (2)  
CLAMP, "C" (4)  
HOIST  
SCREWDRIVER

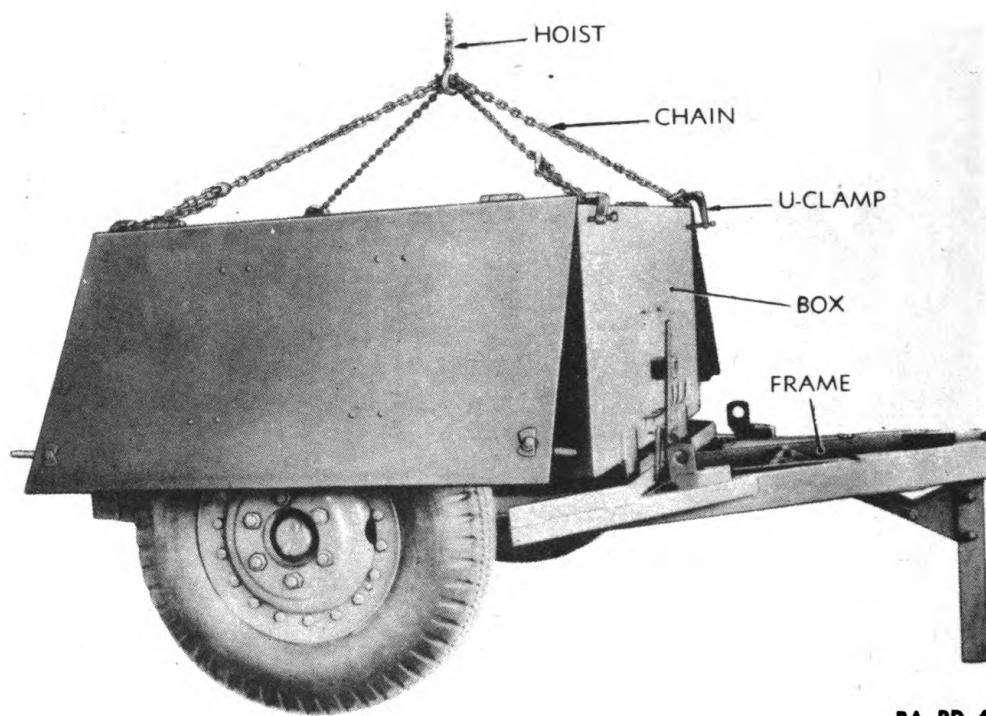
WRENCH (to fit clamp screws)  
WRENCH,  $\frac{7}{8}$ -in.  
WRENCH, open-end,  $1\frac{1}{32}$ -in.

**b. Procedure.****(1) ATTACH C-CLAMPS AND CHAINS ON BOX.**

CHAIN (2) WRENCH (to fit clamp screws)  
CLAMP, "C" (4)

Secure C-clamps to four corners of box and fasten chains to clamps.

ARMORED TRAILER M8



**Figure 10—Box Removal or Installation**

**(2) INSTALL BOX ON FRAME (fig. 10).**

HOIST

WRENCH,  $\frac{7}{8}$ -in.

Attach hoist to chains and lift box high enough to clear frame. Roll frame into position under box and set trailer brakes. Lower box onto frame and secure by replacing eight cap screws through brackets on box to frame. Remove chains and C-clamps.

**(3) INSTALL TOGGLE SWITCH.**

SCREWDRIVER

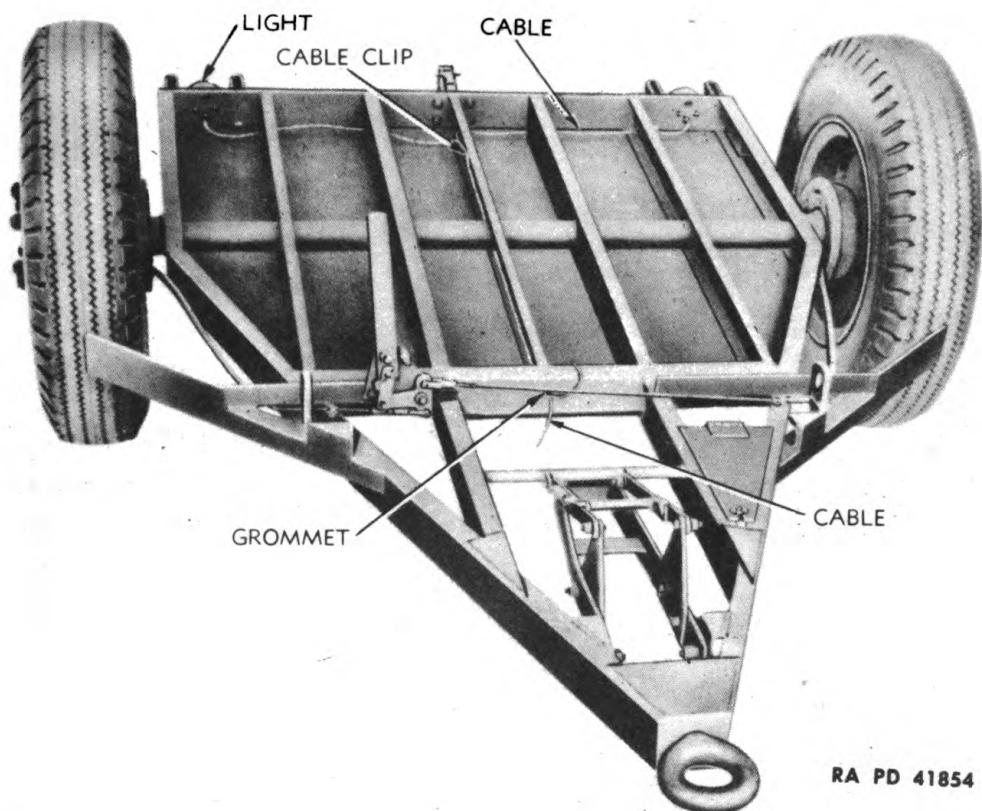
WRENCH, open-end,  $1\frac{1}{2}$ -in.

Place toggle switch in position on box and secure with two screws, lock washers, and nuts. Insert light cable through rubber grommet in battery cover (fig. 9) and connect it to toggle switch lower terminal.

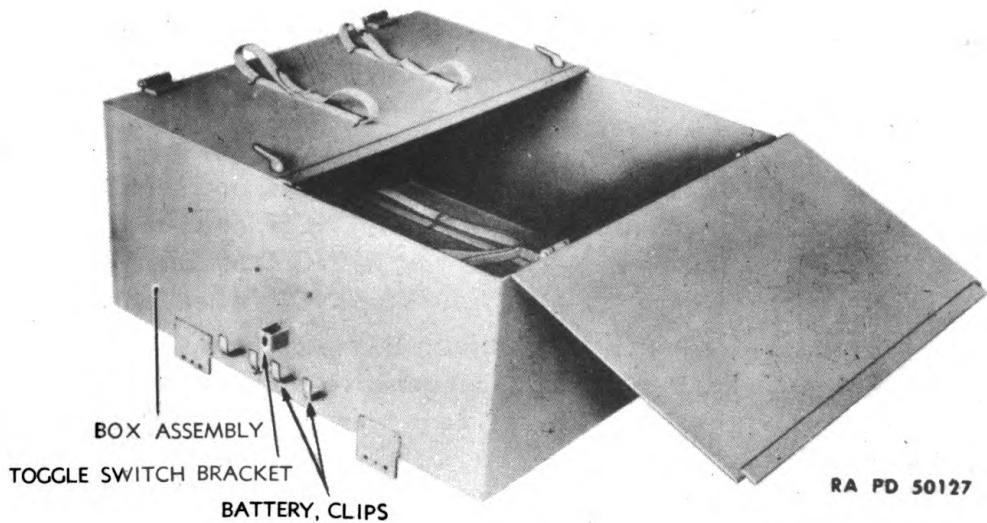
**(4) INSTALL BATTERIES AND CONNECT BATTERY LEADS.** Place batteries into clips on front of box so that positive terminals are up and negative terminals are down. Connect leads from switch upper terminals to positive terminals of batteries. The negative lead must be grounded by attaching it to the lower switch bracket bolt. The light cable connects to the switch lower terminal.

**(5) INSTALL BATTERY COVER.** Place battery cover in position over studs and secure with lock washers and wing nuts.

BOX



**Figure 11—Frame and Wheels**



**Figure 12—Box Assembly**

## ARMORED TRAILER M8

### Section XII

#### FRAME

	Paragraph
Description	40
Removal	41
Maintenance	42
Installation	43

#### 40. DESCRIPTION.

a. The frame (fig. 13) is made from 4-inch channel iron and carries the 2 1/2-inch diameter steel axle which is welded in position to the channels. The 1/8- by 60- by 56-inch belly plate is welded to the bottom of the frame.

b. The folding trailer support stand is bolted to the front of the frame and a coupler is bolted to the rear frame member. The brake backing plates are bolted to the axle flanges and the brake lever assembly is bolted to the forward frame member immediately in front of the box. The lunette passes through the extreme front frame plate and is secured with a washer, castellated nut, and cotter pin.

#### 41. REMOVAL.

##### a. Equipment.

CHAIN (2)	WRENCH, 5/8-in.
CLAMP, "C" (4)	WRENCH, 1 1/16-in.
HANDLE, wrench, wheel hub	WRENCH, 7/8-in.
HOIST	WRENCH, 1 1/16-in.
PLIERS	WRENCH, 2 3/8-in.
SCREWDRIVER	WRENCH, open-end, 1 1/32-in.
WRENCH (to fit clamp screws)	WRENCH, open-end, 7/16-in.
WRENCH, 1/2-in.	WRENCH, socket, 3/4-in.
WRENCH, 9/16-in.	WRENCH, wheel hub

##### b. Procedure (fig. 13).

- (1) REMOVE BOX. See paragraph 37.
- (2) REMOVE WHEELS AND HUB ASSEMBLIES. See paragraph 58 b (1) through (4).

##### (3) REMOVE BRAKE LEVER ASSEMBLY.

PLIERS	WRENCH, 1 1/16-in.
WRENCH, 9/16-in.	

Pull out cotter pins from brake cable rod end pins at the brake lever.

## FRAME

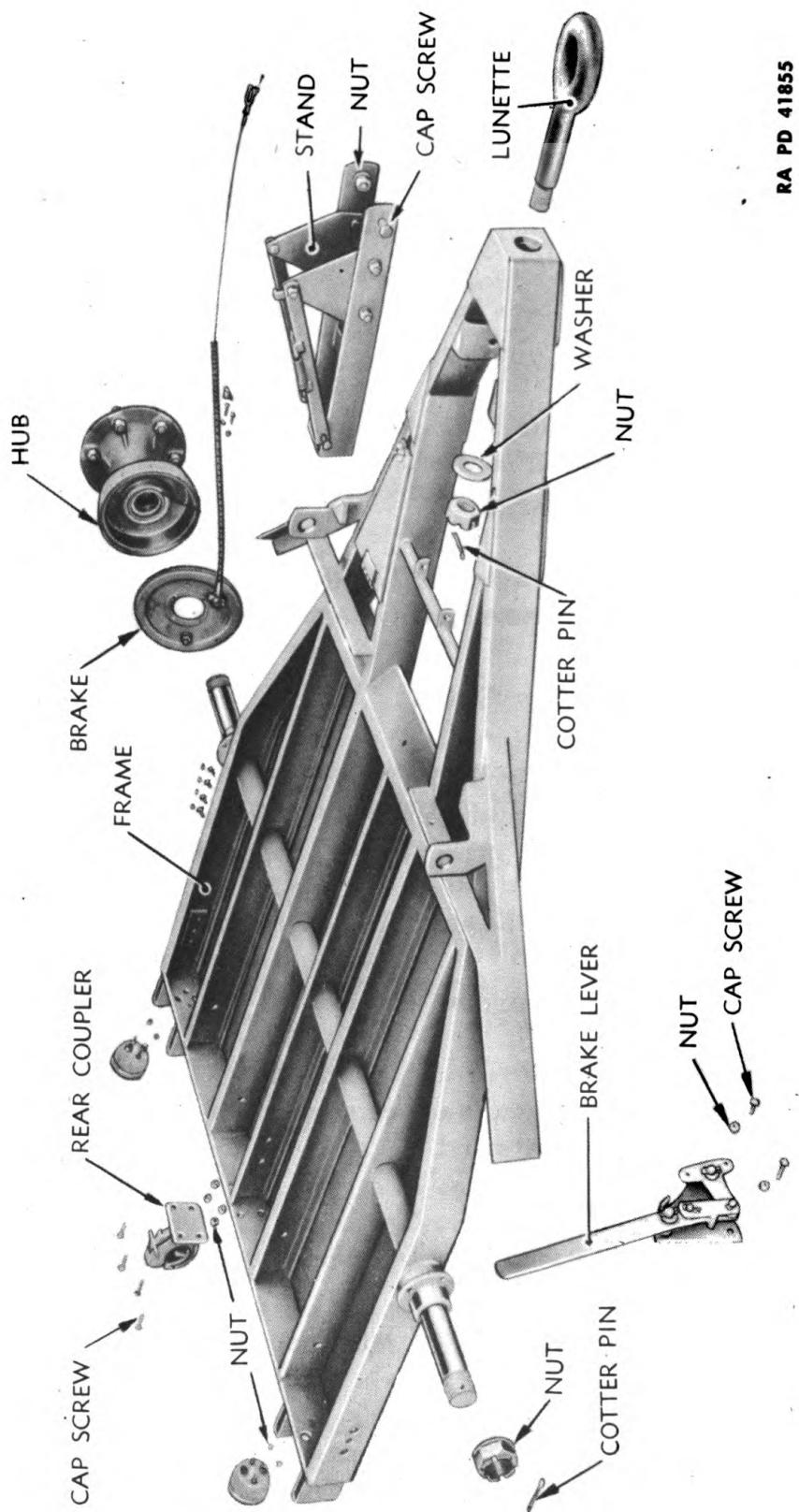


Figure 13—Frame Details

**ARMORED TRAILER M8**

Remove nuts and cap screws which secure brake lever assembly to frame and lift off lever assembly.

**(4) REMOVE BRAKE BACKING PLATES WITH BRAKE ASSEMBLIES.**WRENCH,  $\frac{1}{2}$ -in.WRENCH, socket,  $\frac{3}{4}$ -in.WRENCH,  $\frac{7}{16}$ -in.

Remove nuts and cap screws which secure brake cable conduit support brackets to frame and lift off brackets. Remove cap screws and lock washers from brake backing plate studs and pull off brake backing plates, with brake assemblies and cable assemblies, from axle (fig. 15).

**(5) REMOVE REAR COUPLER.**WRENCH,  $\frac{7}{8}$ -in.WRENCH, socket,  $\frac{3}{4}$ -in.

Remove four safety nuts and cap screws which secure coupler to rear frame member and lift off coupler.

**(6) REMOVE TAILLIGHTS.**WRENCH,  $\frac{1}{2}$ -in.

Disconnect light cables by pulling out plugs at rear of lights. Remove two safety nuts which secure each taillight to rear frame member and pull out lights.

**(7) REMOVE TAILLIGHT CABLE.**WRENCH,  $\frac{1}{2}$ -in.WRENCH, open-end,  $\frac{7}{16}$ -in.

Remove safety nuts and cap screws which secure light cable clips to frame and lift out clips. Pull out light cable from frame.

**(8) REMOVE LUNETTE.**

PLIERS

WRENCH,  $2\frac{3}{8}$ -in.

Pull out cotter pin from lunette. Remove lunette nut and washer and take out lunette.

**(9) REMOVE FRAME SUPPORT STAND.**WRENCH,  $\frac{5}{8}$ -in.WRENCH,  $1\frac{1}{16}$ -in.WRENCH,  $\frac{7}{8}$ -in.WRENCH, socket,  $\frac{3}{4}$ -in.

Remove the four safety nuts and cap screws which secure the support stand to frame and remove stand.

**42. MAINTENANCE.**

- a. Inspect the lunette threads and replace if threads are stripped or otherwise damaged.
- b. Inspect support stand and if any parts are damaged, they should be replaced.
- c. Check axle, and if it is bent or the threads are damaged beyond repair, the frame assembly must be replaced.
- d. Check frame assembly for twisting or bending and if any is evident, replace the frame.

## FRAME

## 43. INSTALLATION.

## a. Equipment.

CHAIN (2)	WRENCH, $\frac{5}{8}$ -in.
CLAMP, "C" (4)	WRENCH, $1\frac{1}{16}$ -in.
HANDLE, wrench, wheel hub	WRENCH, $\frac{7}{8}$ -in.
HOIST	WRENCH, $1\frac{1}{16}$ -in.
PLIERS	WRENCH, $2\frac{3}{8}$ -in.
SCREWDRIVER	WRENCH, open-end, $1\frac{1}{32}$ -in.
WRENCH (to fit clamp screws)	WRENCH, open-end, $\frac{7}{16}$ -in.
WRENCH, $\frac{1}{2}$ -in.	WRENCH, socket, $\frac{3}{4}$ -in.
WRENCH, $\frac{9}{16}$ -in.	WRENCH, wheel hub.

## b. Procedure (fig. 12).

## (1) INSTALL TAILLIGHTS.

WRENCH,  $\frac{1}{2}$ -in.

Position taillights on rear frame member and secure each light with two safety nuts.

## (2) INSTALL TAILLIGHT CABLE.

WRENCH,  $\frac{1}{2}$ -in.WRENCH, open-end,  $\frac{1}{16}$ -in.

Pull cable into position through grommets in frame. Push cable plugs into receptacles in rear of taillights. Secure cable to frame with clips, cap screws, and safety nuts.

## (3) INSTALL REAR COUPLER.

WRENCH,  $\frac{7}{8}$ -in.WRENCH, socket,  $\frac{3}{4}$ -in.

Place coupler in position on rear frame member and secure with four cap screws and safety nuts.

## (4) INSTALL BRAKE BACKING PLATES WITH BRAKE ASSEMBLIES.

WRENCH,  $\frac{1}{2}$ -in.WRENCH, socket,  $\frac{3}{4}$ -in.WRENCH,  $\frac{9}{16}$ -in.

Slip brake backing plates over axle onto studs and secure with lock washers and cap screws. Fasten brake cable conduits to frame with conduit support brackets, cap screws and nuts.

## (5) INSTALL BRAKE LEVER ASSEMBLY.

PLIERS

WRENCH,  $1\frac{1}{16}$ -in.WRENCH,  $\frac{9}{16}$ -in.

Place brake lever assembly in position on front of frame and secure to frame with cap screws and safety nuts. Connect brake cable assemblies to lever by installing rod end pin through cable yoke and lever and securing with cotter pin.

**ARMORED TRAILER M8****(6) INSTALL FRAME SUPPORT STAND.**WRENCH,  $\frac{5}{8}$ -in.WRENCH,  $1\frac{1}{16}$ -in.WRENCH,  $\frac{7}{8}$ -in.WRENCH, socket,  $\frac{3}{4}$ -in.

Hold support stand in position on front of frame and install four cap screws and safety nuts, securing stand to frame.

**(7) INSTALL LUNETTE.**

PLIERS

WRENCH,  $2\frac{3}{8}$ -in.

Push lunette through hole in front frame member and secure it with a washer, slotted nut, and cotter pin.

**(8) INSTALL HUB ASSEMBLIES AND WHEELS.** See paragraph 58.**(9) INSTALL Box.** See paragraph 39.

## Section XIII

## LIGHTING SYSTEM

	Paragraph
Description of lighting system	44
Trouble shooting for lighting system	45
Battery replacement	46
Toggle switch replacement	47
Cable replacement	48
Lamp replacement	49
Light replacement	50

## 44. DESCRIPTION OF LIGHTING SYSTEM.

a. The lights are of the standard combat zone safety type with sealed lamp units and are bolted to the rear frame member. Power for the lights is supplied by two "hot-shot" batteries which provide a minimum life of 64 hours lamp use. The batteries are held by clips welded on the front of the box, and are connected by wires to a toggle switch. The toggle switch is attached to a bracket on the front of the box between the batteries, and is connected to the taillights by a cable which is clipped to the center channel of the frame. The batteries and toggle switch are enclosed in a cover which is held onto the front of the box by wing nuts. Rubber grommets are used where cable passes through cover and frame members.

## 45. TROUBLE SHOOTING FOR LIGHTING SYSTEM.

## a. Lights Are Dim.

Probable Cause	Probable Remedy
Weak battery or batteries.	Test batteries and replace if necessary.
Loose or dirty connections.	Clean connections and tighten.

## b. No Lights.

Burned out batteries.	Replace batteries.
Short circuit.	Locate short and repair.
Broken wire.	Locate break and splice or replace wire.
Burned out lamps.	Replace sealed lamp unit.

## 46. BATTERY REPLACEMENT.

## a. Procedure (fig. 9).

(1) REMOVE BATTERY COVER. Take off wing nuts and lock washers which secure cover to box and lower cover onto frame.

**ARMORED TRAILER M8**

(2) REMOVE BATTERY. Disconnect leads from toggle switch to battery at battery terminals. Lift battery out of clips.

(3) INSTALL NEW BATTERY. Place battery in clips, connect leads from toggle switch to battery terminals and secure battery cover. NOTE: Batteries must be installed with positive terminals up and negative terminals down. Connect leads from the switch upper terminals to the positive terminals of batteries. The negative lead must be grounded by attaching it to the lower switch bracket bolt. The light cable lead is attached to lower switch terminal.

**47. TOGGLE SWITCH REPLACEMENT.****a. Equipment.**

SCREWDRIVER	WRENCH, open-end, $1\frac{1}{32}$ -in.
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**b. Procedure.**

(1) REMOVE BATTERY COVER. Take off wing nuts and lock washers which secure cover to box and lower cover onto frame.

(2) DISCONNECT BATTERY LEADS. Remove thumb nuts which secure leads to battery terminals and pull leads off terminals.

**(3) DISCONNECT LIGHT CABLE.**

WRENCH, open-end, $1\frac{1}{32}$ -in.
--

Remove nut and washer which secures light cable to switch terminal and pull off cable.

**(4) REMOVE TOGGLE SWITCH.**

SCREWDRIVER	WRENCH, open-end, $1\frac{1}{32}$ -in.
-------------	--

Remove nuts, lock washers, and screws which secure toggle switch to bracket and lift out switch with battery leads. Remove nuts and washers holding battery leads to switch terminals and pull off leads.

(5) INSTALL NEW TOGGLE SWITCH. Install new switch in the reverse order of removal.

**48. CABLE REPLACEMENT.****a. Equipment.**

CHAIN (2)	WRENCH, $\frac{7}{16}$ -in.
CLAMP, "C" (4)	WRENCH, $\frac{1}{2}$ -in.
HOIST	WRENCH, $\frac{7}{8}$ -in.
SCREWDRIVER	WRENCH, open-end, $1\frac{1}{32}$ -in.
WRENCH (to fit clamp screws)	

**b. Procedure.**

(1) REMOVE BOX. See paragraph 37.

(2) REMOVE CABLE ASSEMBLY.

WRENCH, $\frac{7}{16}$ -in.	WRENCH, $\frac{1}{2}$ -in.
-----------------------------	----------------------------

Twist connecting plugs out of tail lamp sockets. Remove cap screws

## LIGHTING SYSTEM

and safety nuts which secure cable clips to center channel and remove clips. Pull out cable assembly.

(3) **INSTALL NEW CABLE ASSEMBLY.** Install new cable assembly by reversing order of removal.

### 49. LAMP REPLACEMENT.

#### a. Equipment.

SCREWDRIVER

#### b. Procedure.

(1) **REMOVE LENS ASSEMBLY.**

SCREWDRIVER

Remove two screws from lens cover and pull off cover and lens assembly.

(2) **REMOVE LAMP UNIT.**

(3) **INSTALL NEW LAMP UNIT.**

### 50. LIGHT REPLACEMENT.

#### a. Equipment.

CHAIN (2)

WRENCH (to fit clamp screws)

CLAMP, "C" (4)

WRENCH, 1/2-in.

HOIST

WRENCH, 7/8-in.

SCREWDRIVER

WRENCH, open-end, 1 1/3 2-in.

#### b. Procedure.

(1) **REMOVE BOX.** See paragraph 37.

(2) **REMOVE LIGHT ASSEMBLY.**

WRENCH, 1/2-in.

Twist and pull light cable connecting plugs out of light sockets. Remove two safety nuts which secure each light assembly to rear frame member and lift off assembly.

(3) **INSTALL NEW LIGHT ASSEMBLY.** Reverse the order of removal to install new light.

## ARMORED TRAILER M8

## Section XIV

## TIRES, WHEELS, HUBS AND WHEEL BEARINGS

	Paragraph
Wheel and tire description .....	51
Wheel and tire trouble shooting .....	52
Tire removal .....	53
Tire maintenance .....	54
Tire installation .....	55
Wheel replacement .....	56
Wheel bearing and hub maintenance and adjustments .....	57
Wheel bearing and hub replacement .....	58

## 51. WHEEL AND TIRE DESCRIPTION.

a. The wheels are of the pressed steel combat type and have a 5 3/4-inch disk and 20 x 6.00 C.T. rims. Each wheel is fastened to its hub by six studs and nuts. The hub is carried on two opposed tapered roller bearings and is held on the axle by a slotted nut and cotter pin. The hub and brake drum are cast integrally.

b. The tires are size 9.00 x 20 and are of the combat type with transport tread.

## 52. WHEEL AND TIRE TROUBLE SHOOTING.

## a. Wobbly Wheel.

Probable Cause	Probable Remedy
Loose studs.	Tighten or replace.
Improper bearing adjustment.	Adjust as specified in paragraph 57 f.

## b. Scuffed Tires.

Underinflation.	Inflate to correct pressure.
Bent axle.	Report to higher authority or replace frame.

## c. Air Leakage.

Valve cap missing.	Install new cap.
Valve cap seal broken.	Replace valve cap.
Valve core loose or damaged.	Tighten or replace core.
Torn or punctured tube.	Repair tube.

## 53. TIRE REMOVAL.

## a. Equipment.

CAP, valve  
IRON, spoon

JACK, hydraulic  
WRENCH, rim cap screw

## TIRES, WHEELS, HUBS AND WHEEL BEARINGS

### b. Procedure (fig. 14).

#### (1) JACK UP TRAILER.

JACK, hydraulic

Set brakes on trailer. Place jack under trailer and raise until tire clears ground.

#### (2) DEFlate TIRE COMPLETELY.

CAP, valve

Use slotted end of valve cap to remove valve core. *Be sure to deflate tubes completely before removing cap screws from the ring. Otherwise an inflated tube may easily blow off the ring causing severe injury or death.*

#### (3) REMOVE TIRE ASSEMBLY.

WRENCH, rim cap screw

Remove eighteen cap screws which hold ring to rim and pull off ring and tire assembly.

#### (4) REMOVE BEAD LOCK.

IRON, spoon

Inflate the tube slowly until the beads spread away from the bead lock. Unlock clamp on bead lock by lifting with spoon iron. If the bead lock sticks to the beads of the tire, pry it loose with the spoon iron.

(5) REMOVE TUBE. Deflate the tube again. Remove tube flap and pull tube out of tire.

## 54. TIRE MAINTENANCE.

a. Holes in inner tubes should be repaired by cold patching. Hot patching or vulcanizing should not be attempted.

b. When an inner tube has been removed for repair, the tire should be placed in a spreader and the inside examined for tears and roughness. Remove all dirt and pebbles.

c. Tires must be inflated equally and not operated when under-inflated. Before pumping air into tubes, depress valve momentarily to allow air to blow out any dirt in the valve. Always keep caps on valves to prevent entrance of foreign matter.

d. Oil and grease have a harmful effect on rubber and every attempt should be made to keep these substances from coming in contact with tires or tubes.

## 55. TIRE INSTALLATION.

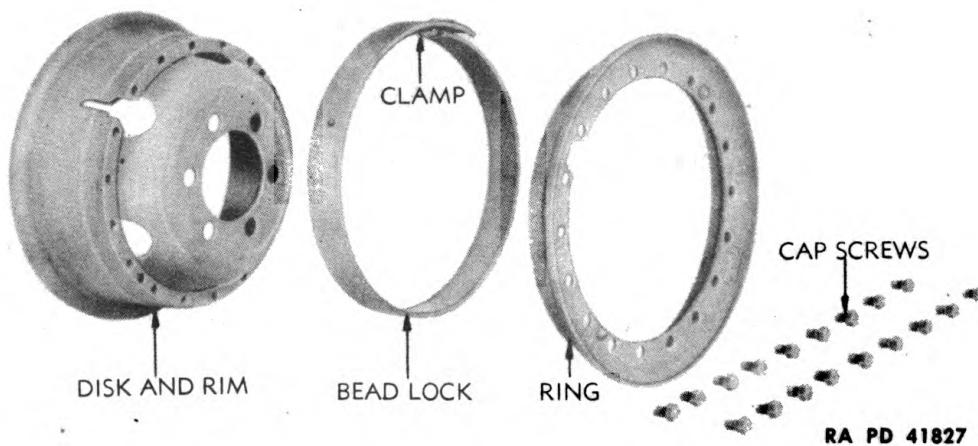
### a. Equipment.

IRON, spoon

JACK, hydraulic

WRENCH, rim cap screw

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RA PD 41827

Figure 14—Wheel Details

b. Procedure.

- (1) **INSTALL TUBE.** Push tube into tire and install tube flap.
- (2) **INSTALL BEAD LOCK.**

IRON, spoon

Replace valve core in valve and inflate tube until beads expand to accommodate bead lock. Make sure that valve is centered in hole in bead lock and insert bead lock between beads. Expand bead lock with spoon iron and secure with clamp. Deflate tube until tire beads compress against bead lock.

- (3) **INSTALL TIRE ASSEMBLY ON RIM.**

WRENCH, rim cap screw

Place tire assembly on rim so that valve is centered in valve opening in rim. Place side ring in position and install eighteen cap screws, securing tire assembly to rim. Inflate tire to correct pressure, lower trailer, and remove hydraulic jack.

56. WHEEL REPLACEMENT.

a. Equipment.

HANDLE, wrench, wheel hub  
IRON, spoon  
JACK, hydraulic

WRENCH, rim cap screw  
WRENCH, wheel hub

b. Procedure.

- (1) **REMOVE TIRE ASSEMBLY.** See paragraph 53.
- (2) **REMOVE DISK AND RIM** (fig. 14).

HANDLE, wrench, wheel hub      WRENCH, rim cap screw

Remove six wheel stud nuts using small end of wheel hub wrench. Pull disk and rim off studs.

## TIRES, WHEELS, HUBS AND WHEEL BEARINGS

(3) **INSTALL NEW WHEEL.** Reverse the order of removal to install new wheel. NOTE: Successively tighten opposite stud nuts to prevent cocking wheel on studs; do not use an extension or wrench handle to tighten nuts, or apply excessive force other than direct hand effort. Never use oil on wheel studs.

### 57. WHEEL BEARING AND HUB MAINTENANCE AND ADJUSTMENTS.

- a. Inspect the bearing rollers for pits, chipping, and wear. Replace bearing cone assembly if rollers are damaged or worn.
- b. Inspect the bearing cups for wear, pits, and scratches. If any one of these is evident, the cups should be replaced.
- c. Inspect hub studs and replace any studs which have stripped threads or other damage.
- d. Inspect brake drums for scoring. If drums are scored, they must be turned smooth; report to next higher authority.
- e. Inspect grease retainer for wear. Replace retainer if it is worn or impregnated with dirt.
- f. **Bearing Adjustment.** Bearings are adjustable for wear, and their satisfactory operation and long life depend on proper adjustment and lubrication. Adjust bearings as follows:
  - (1) Jack up trailer until wheel is free of ground.
  - (2) Release the parking brakes fully so that there is absolutely no drag on the brake drums.
  - (3) Using wheel hub wrench and handle, remove hub cap.
  - (4) Using a pair of pliers, pull cotter pin from axle through hole in side of hub.
  - (5) Tighten axle nut until a drag is felt on revolving wheel and then slack off nut  $\frac{1}{3}$  turn.
  - (6) Test for excessive end play; stand directly in front of wheel, rest one end of wheel hub wrench handle on floor under tire, and lift up on tire. By working wrench handle up and down while holding one finger on outer bearing cone, excessive bearing play may be quickly detected.
  - (7) When adjustment is correct, replace cotter pin and install hub cap. Lower trailer to ground and remove jack.

### 58. WHEEL BEARING AND HUB REPLACEMENT.

#### a. Equipment.

BLOCK, wood

JACK, hydraulic

DRIFT, brass

PLIERS

HAMMER

WRENCH, wheel hub

HANDLE, wrench, wheel hub

## ARMORED TRAILER M8

### b. Procedure.

(1) JACK UP TRAILER.

## JACK, hydraulic

Set brakes on trailer. Place jack under trailer and raise until tire just clears ground.

**(2) REMOVE WHEEL AND TIRE ASSEMBLY.**

**HANDLE**, wrench, wheel hub      **WRENCH**, wheel hub

Remove six wheel stud nuts. Right-hand wheel studs have right-hand threads and left-hand wheel studs have left-hand threads. Pull wheel and tire assembly off studs.

(3) REMOVE HUB CAP AND HUB NUT (fig. 15).

**HANDLE**, wrench, wheel hub      **WRENCH**, wheel hub

## PLIERS

Using slots in large end of hub wrench, remove hub cap. Pull cotter pin from axle through hole in side of hub. Remove axle nut.

(4) REMOVE HUB AND BEARINGS (fig. 15). Pull hub forward and then push it back in position, leaving outer bearing cone free. Pull outer bearing cone off axle and then pull off hub, inner bearing cone and grease retainer.

(5) REMOVE BEARING CUPS (fig. 15).

### DRIFT, brass

## HAMMER

Place drift on inside edge of cup to be removed and hit first one side of the cup and then the other. By alternating in this manner, the cup will come out straight with the cup bore and danger of wedging the cup in the bore will be minimized.

**(6) INSTALL NEW BEARING CUPS IN HUB.**

## BLOCK, hardwood

## HAMMER

## CUP, old bearing

Start new cup square with bore. With hardwood over cup, drive it in until it is flush with outer edge of hub. Then place old cup over new one and drive new cup in until it is absolutely tight with cup bore flange. Be sure that cup is squarely seated because if it is not, it will alter the distance between bearing centers and prevent proper installation of wheel.

(7) **INSTALL HUB AND BEARINGS.** Place bearing cone assemblies in cups in hub and pack with approximately  $\frac{3}{8}$  pound of **GREASE**, general purpose, No. 2. Place oil retainer in hub and slide hub and bearings onto axle. Install axle nut and adjust bearings as explained in paragraph 57 f. Install cotter pin, hub cap, and wheel and tire assembly by reversing the order of removal, steps **b** (1) (2) and (3) of this paragraph.

TIRES, WHEELS, HUBS AND WHEEL BEARINGS

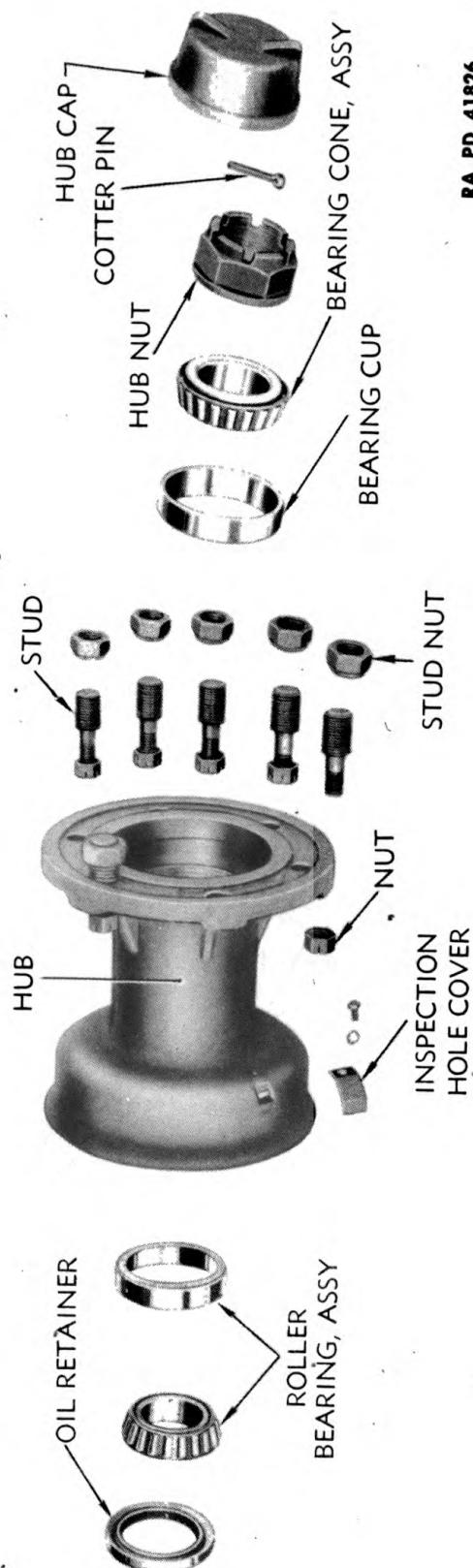


Figure 15—Wheel Hub Disassembled

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## Section XV

## PARKING BRAKES

	Paragraph
Description	59
Trouble shooting	60
Adjustment	61
Shoe removal	62
Shoe installation	63
Cable removal	64
Cable installation	65

## 59. DESCRIPTION (fig. 16).

a. The brakes are Bendix, mechanical, 9- by 1 $\frac{3}{4}$ -inch expanding shoe type. The brake shoes are held in position at the rear end of the backing plate by the anchor pin and the shoe return springs, at the front end by the adjusting screw and spring, and at the top and bottom by the hold-down pins. An eccentric which contacts the upper shoe is used for adjustment and is accessible at the rear of the brake backing plate. The brakes are for parking purposes only, and are operated by a hand lever attached to the front of the frame and connected to the brake assembly by a cable assembly.

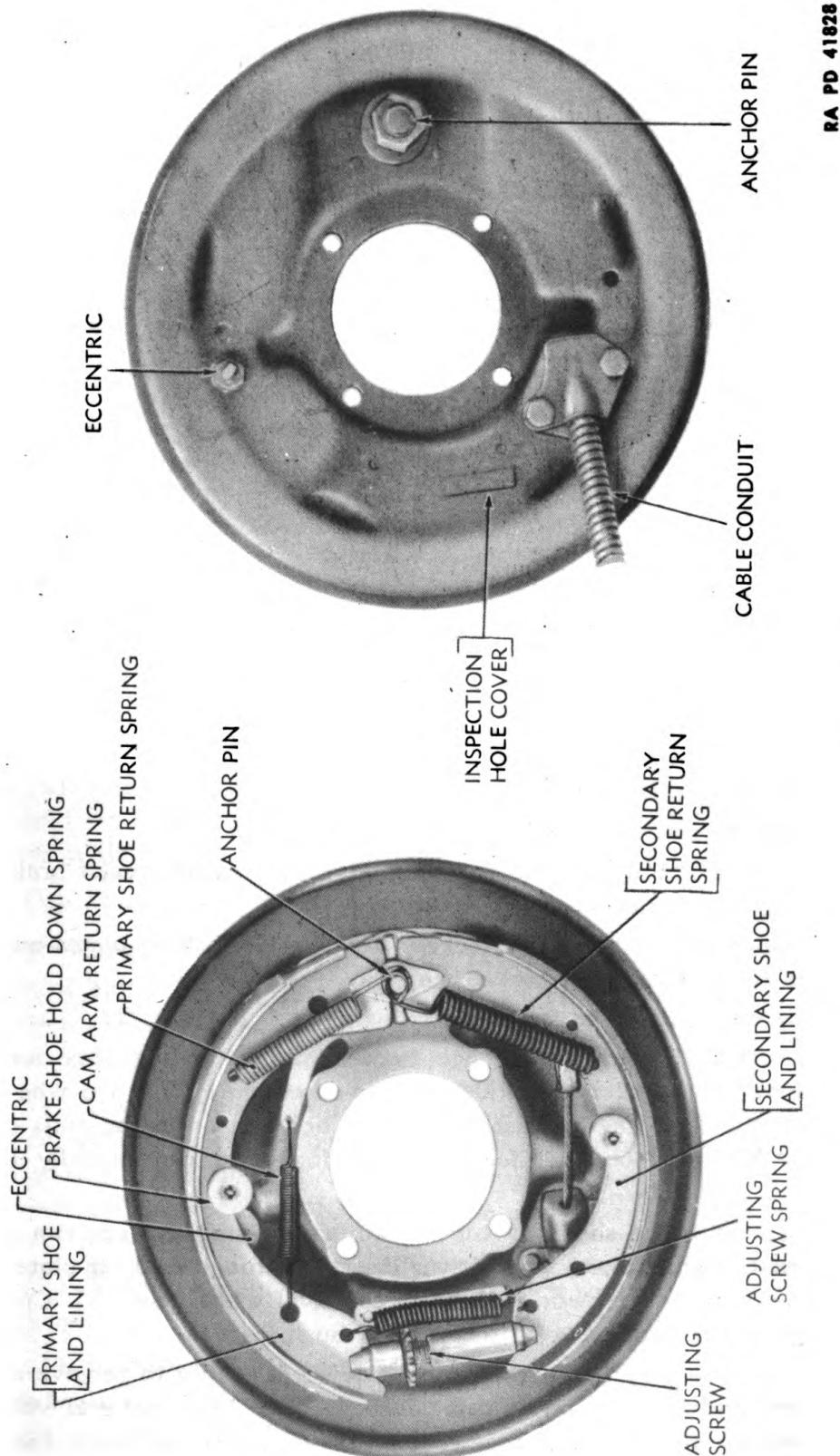
b. **Functioning.** When the brake hand lever is moved toward the right side of the trailer, the brake cables are pulled forward and in turn pull on the cam operating lever to which they are attached. The movement of the cam operating lever rotates the arm and cam. The cam spreads the brake shoes apart at the anchor pin and forces them in contact with the brake drums. When the hand lever is brought back into the released position, the shoe return springs pull the shoes away from the drum, and the cam arm spring pulls the cam arm into its neutral position.

## 60. TROUBLE SHOOTING.

## a. Brakes Will Not Hold.

Probable Cause	Probable Remedy
Brakes out of adjustment.	Adjust as explained in paragraph 61.
Brake bands worn out.	See next higher authority and replace shoe assembly.
Cables too loose.	Adjust cables at rod end yoke.
Broken cable.	Install new cable.
Hand lever damaged.	Replace damaged part.

**PARKING BRAKES**



**Figure 16—Wheel Brake Details**

ARMORED TRAILER M8

b. Brakes Dragging.

Probable Cause	Probable Remedy
Shoe return springs broken or taken permanent set.	Replace springs.
Arm and cam return spring broken or taken permanent set so that it does not return cam to neutral position.	Replace springs.
Hand lever not completely released.	Release hand lever completely.
Insufficient clearance between shoe and drum.	Adjust brake shoes, see paragraph 61.
Loose wheel bearings.	Adjust bearings.
Grease on linings.	Install new shoe assemblies and adjust brakes. See paragraph 61.

61. ADJUSTMENT.

a. Equipment.

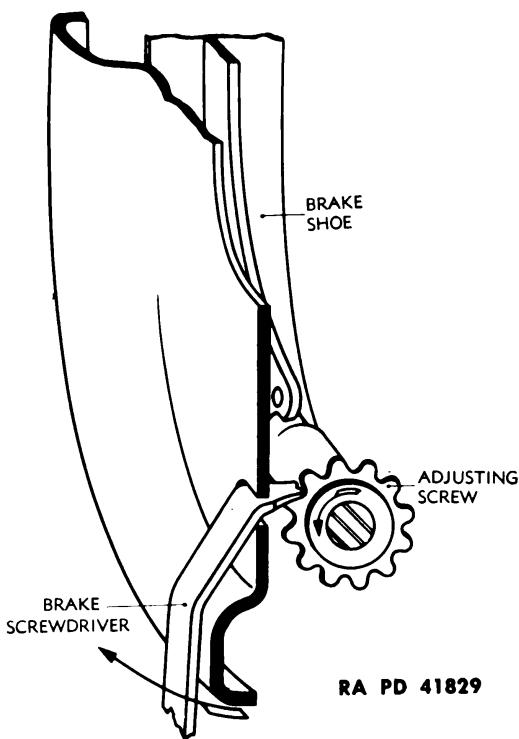
GAGE, feeler, 0.010-in.  
HAMMER, soft metal  
JACK, hydraulic  
PLIERS

SCREWDRIVER, brake  
WRENCH, adjustable, 16-in.  
WRENCH, open-end,  $\frac{1}{2}$ -in.  
WRENCH, open-end, 1-in.

b. Procedure (fig. 16).

- (1) Jack up trailer until wheels are free of ground.
- (2) Remove cotter pin and rod end pin which secures each brake cable rod end yoke to hand lever assembly.
- (3) Remove adjustment hole covers from brake backing plates and inspection hole covers from brake drums.
- (4) Loosen lock nut on eccentric adjustment.
- (5) Insert 0.010-inch feeler gage between lining on top shoe and brake drum. Turn eccentric adjustment in direction of forward wheel rotation until feeler gage is just snug at anchor and adjusting ends of top shoe. Tighten eccentric lock nut, holding eccentric carefully in position.
- (6) Expand brake shoes by turning adjusting screw toward rim of backing plate (using brake screwdriver inserted through backing plate), moving outer end of screwdriver toward center of wheel (fig. 17). Continue until brake drum can be just turned by hand.
- (7) Pull cables by hand toward hand lever assembly to remove all cable slack and lost motion at cam levers. Adjust each rod end yoke so that rod end pin will just enter yoke and lever assembly freely. Lock rod end yokes with jam nuts and insert cotter pins in rod end pins.

## PARKING BRAKES



**Figure 17—Brake Adjustment—Using Adjusting Screw**

(8) Pull hand lever until it is vertical and locked over center. This should set brakes on both wheels. If either brake does not hold when lever is set, tighten the adjusting screw on the loose brake.

(9) Install inspection hole and adjustment hole covers.

e. **Anchor Pin Adjustment** (fig. 18). The preceding nine steps are usually sufficient to adjust the brakes correctly; however, if the adjustment is not correct, a final adjustment can be made with the anchor pin as follows:

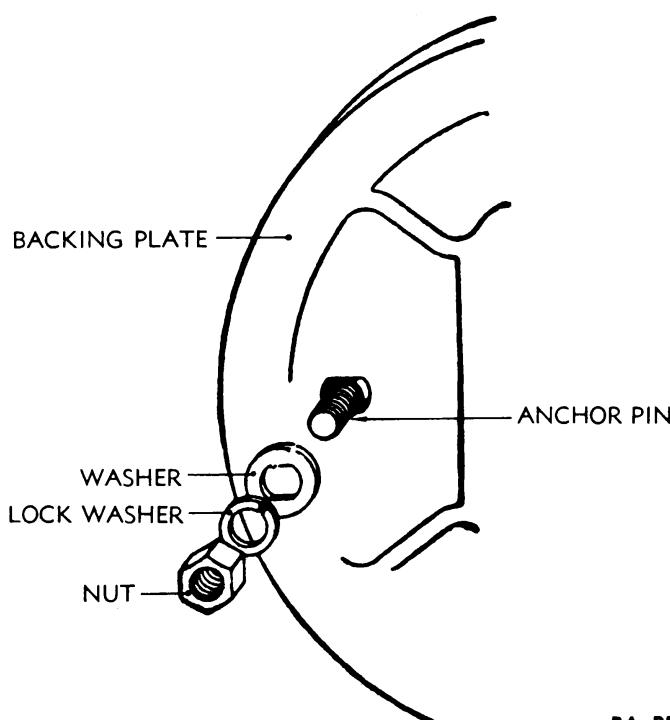
(1) Loosen anchor pin nut one turn and tap pin slightly in necessary direction to correct clearance, using a soft metal hammer. At the same time, turn eccentric in direction of forward wheel rotation to give the specified clearance of 0.010 inch at the anchor end of the shoe against which the eccentric operates.

(2) Tighten anchor pin nut with a 16-inch wrench. Tighten eccentric lock nut.

(3) Recheck both clearances carefully to insure tightening anchor nut has not disturbed lining to drum clearance.

**NOTE:** The above adjustment is sometimes necessary after installing new brake shoe assemblies.

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RA PD 41831

Figure 18—Anchor Pin Details

**62. SHOE REMOVAL.**

**a. Equipment.**

HANDLE, wrench, wheel hub

PLIERS, spring puller

JACK, hydraulic

WRENCH, wheel hub

PLIERS, diagonal

**b. Procedure.**

(1) REMOVE WHEELS AND HUB ASSEMBLY. See paragraph 58 b (1) through (4).

(2) DISCONNECT BRAKE CABLES.

PLIERS

Remove cotter pin and rod end pin which secures brake cable rod end yoke to hand lever assembly.

(3) REMOVE PULL-BACK SPRINGS.

PLIERS, spring puller

Remove cam lever spring, anchor springs, and adjusting screw spring.

(4) REMOVE SHOE ASSEMBLIES. Push down hold-down spring cups, twist cups 90 degrees and remove. Lift out brake shoe assemblies and adjusting screw.



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**(4) REMOVE CABLE FROM CONDUIT.**

WRENCH, open-end,  $\frac{3}{4}$ -in.

Loosen cable rod end yoke jam nut and remove yoke and nut. Pull cable assembly out of conduit.

**65. CABLE INSTALLATION.**

**a. Equipment.**

GAGE, feeler, 0.010-in.

HAMMER, soft metal

HANDLE, wrench, wheel hub

JACK, hydraulic

PLIERS, diagonal

PLIERS, spring puller

SCREWDRIVER, brake

WRENCH, adjustable, 16-in.

WRENCH,  $\frac{1}{2}$ -in.

WRENCH,  $\frac{9}{16}$ -in.

WRENCH, open-end,  $\frac{3}{4}$ -in.

WRENCH, wheel hub

**b. Procedure.**

**(1) INSTALL CABLE ASSEMBLY IN CONDUIT.**

WRENCH, open-end,  $\frac{3}{4}$ -in.

Lubricate cable freely with GREASE, general purpose, No. 2, and push cable through conduit. Install rod end yoke jam nut and yoke on threaded end of cable assembly.

**(2) INSTALL CABLE AND CONDUIT ASSEMBLY.**

WRENCH,  $\frac{1}{2}$ -in.

Install bolts and lock washers which secure cable conduit to brake backing plate. Secure conduit to front of frame with conduit support brackets, cap screws, and nuts. Slip yoke at brake end of cable onto cam actuating lever.

**(3) INSTALL BRAKE SHOES.** See paragraph 63 b (1) through (3).

**(4) INSTALL HUB AND WHEEL ASSEMBLIES.** See paragraph 58 b (7),

**(5) ADJUST BRAKES.** See paragraph 61.

## Section XVI

## SHIPMENT AND STORAGE

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## 66. SHIPMENT BY RAIL.

a. **General Procedure.** In case of shipment of individual vehicles, or where the organization does not accompany its transportation, vehicles are turned over to the quartermaster for shipment. In such a case the quartermaster is responsible for furnishing the necessary personnel and material for loading and blocking equipment. Vehicles are usually shipped on flat cars (36 to 60 ft long), gondolas (36 to 60 ft long), and those types of cars with wooden floors which are most desirable because of the ease of loading and blocking.

b. **Preparation of Railroad Cars.** Transportation must be inspected to determine if the cars are in suitable condition to carry the load safely to its destination. Sound floors are required. All loose nails, debris, and projections not an integral part of the car and the prescribed blocking must be removed.

c. **Preparation of Vehicles for Loading.**

(1) If troops are not traveling with their vehicles, all loose property and tools should be packed and secured in boxes, and hoods should be sealed down with cap seals.

(2) Tires should be inflated to at least 10 pounds above the normal pressure in order to avoid sagging or shifting of vehicle in blocks.

d. **Facilities for Loading.** Whenever possible vehicles should be loaded utilizing permanent end ramp and platform. Movement from one flat car to another along the length of the train is made possible by cross-over plates, or a spanning platform after dismounting the railroad car hand brake. An improvised ramp can be made from railroad ties.

e. **Securing.**

(1) In securing or blocking a vehicle, three motions (lengthwise, side-wise, and bouncing) must be prevented.

(2) Material for blocking on wood floor cars should be not less than 2 inches by 4 inches. Blocks cut from material 6- by 6-inch or 8- by 8-inch are preferable. A piece of strap iron should be placed crosswise over the front of the frame and secured to the floor. Each wheel will be secured

### ARMORED TRAILER M8

with four strands of No. 9 black annealed wire, by passing the wire through the wheel disks and connecting the ends to the car stake pockets. Be careful not to let the wire touch the tires. Eliminate end play by passing wire through the lunette to the nearest stake pockets. Tighten all the wires by inserting a short rod and twisting. Cloth or burlap should be placed between the rubber and the blocks to reduce wear. Blocking should be snug to eliminate play. In case of metal floors, blocking between the sides and end walk is required.

(3) The trailer parking brake should be set.

(4) Equipment moving from manufacturer to arsenal or proving grounds, or from arsenal or proving grounds to army post, or individual units moving from one army post to another *must* be placarded "DO NOT HUMP."

(5) Further details on loading are to be found in "Special Supplement Containing Rules Governing the Loading of Mechanized and Motorized Army Equipment" published by the Association of American Railroads, Operations and Maintenance Department, April 1, 1941. Information on shipping instructions is also given in FM 101-10.

## 67. SHIPMENT BY WATER.

a. Preparation is, with certain modifications, the same as that indicated for rail shipment if the vehicles are accompanying the troops. Special attention must be given to rust prevention, however. All exposed unpainted metal and working parts should be coated with COMPOUND, rust-preventive, thin film.

## 68. LIMITED STORAGE.

a. Vehicles in this category are those which are ready for immediate service but not used for less than 30 days. The vehicles must be cleaned and lubricated thoroughly before they are placed in storage and the various types of nonmetallic materials must be protected according to existing regulations. Brakes will not be set.

## 69. INDEFINITE STORAGE.

a. Vehicles in this category are those which will not be required for service for an indefinite period. The storage of vehicles and equipment and the inspection thereof for this situation is reviewed in AR 30-1055.

b. **Storage Conditions.** Vehicles will be stored in closed buildings or covered sheds if available. In lieu thereof, cover by tarpaulin. Storage surface should be solid, free from crushed rock, deep dust and soil surfacing and properly drained. Vehicles should be raised and blocked to keep the tires off the ground. If not completely serviced and main-

## SHIPMENT AND STORAGE

tained, each vehicle is tagged to indicate what repairs are required before it is returned to service.

c. **Tires.** Pneumatic tires and tubes should be removed and kept in a cool, dark, dry place. Used casings should be repaired, cleaned and wrapped in burlap, paper, or cloth, and stored vertically side by side. Tubes should be deflated, removed from the casing, cleaned, repaired, folded loosely, and stored in pasteboard cartons; care should be taken that there are no sharp folds, and that a small amount of air should be left in the tube to keep creases from forming.

d. **Bodies.** All exposed metal parts of the body and chassis should be treated as provided in AR 850-18, latest revision.

e. **Equipment.** All tools and accessories will be repainted or re-greased if necessary.

f. **Inspection of Vehicles in Storage.** Inspection of vehicles in storage will be made not less than once each month, under the direct supervision of a commissioned officer, to see that instructions contained in AR 850-15 are being complied with.

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Section XVII

REFERENCES

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**70. STANDARD NOMENCLATURE LISTS.**

- a. Cleaning, preserving, and lubricating materials; recoil fluids, special oils, and miscellaneous related items . . . . . SNL K-1
- b. Trailer, armored, M8 . . . . . SNL G-157

Current Standard Nomenclature Lists are as tabulated here. An up-to-date list of SNL's is maintained as the "Ordnance Publication for Supply Index" . . . . . OPSI

**71. EXPLANATORY PUBLICATIONS.**

- a. Cleaning, preserving, lubricating, and welding materials and similar items issued by the Ordnance Department . . . . . TM 9-850
- b. Detailed lubrication instructions for ordnance materiel . . . . . OFSB  
6 Series
- c. **Maintenance and Repair.**
  - Automotive brakes . . . . . TM 10-565
  - Chassis, body, and trailer units . . . . . TM 10-560
  - Echelon system of maintenance . . . . . TM 10-525
  - Fire prevention, safety precautions, accidents . . . . . TM 10-360
  - Maintenance and repair . . . . . TM 10-520
  - Military motor vehicles . . . . . AR 850-15
  - Motor transport inspections . . . . . TM 10-545
- d. **Miscellaneous.**
  - Army Motors, monthly publication of the Technical Service Division of the Holabird Ordnance Motor Base, Baltimore, Maryland . . . . .
  - Camouflage . . . . . FM 5-20
  - Defense against chemical attack . . . . . FM 21-40
  - Explosives and demolitions . . . . . FM 5-25
  - Hand, measuring, and power tools . . . . . TM 10-590
  - List of publications for training, including training films and film strips . . . . . FM 21-6

**REFERENCES****e. Storage and Shipment.**

Special supplement containing rules governing the loading of mechanized and motorized Army equipment published by the Association of American Railroads, Operations and Maintenance Department, April 1, 1941

Staff Officers' Field Manual, organization, technical and logistical data . . . . .	FM 101-10
Storage of motor-vehicle equipment . . . . .	AR 850-18
Storage of motor-vehicle equipment . . . . .	AR 30-1055

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BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,  
*Chief of Staff.*

OFFICIAL:

J. A. ULIQ,  
*Major General,*  
*The Adjutant General.*

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17(17)

(For explanation of symbols, see FM 21-6)

## NOTES

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